

NOVEMBER, 1906

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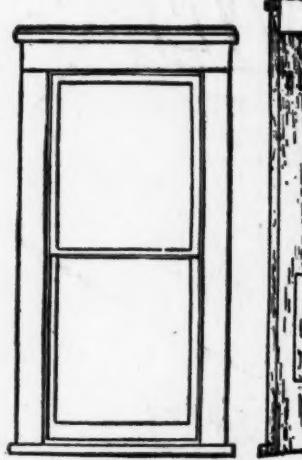
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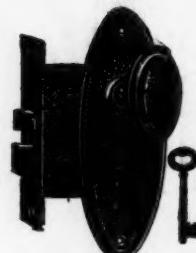
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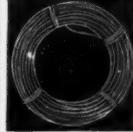
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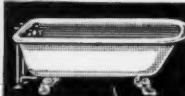
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Handsome brass trimmed beds, like picture, twice as heavy as ordinary bed of this style. Head 65-in. high; brass tubing 15-in. diam. handsomely finished in bronze; good enough for anyone. Retail for \$35.00. Our price - \$17.50. 200 Wooden beds, nicely carved good as new, each - \$1.50. Full size cotton top mattresses from - \$1.00 up. Felt mattresses - - \$2.25. Beds and bedding of all kinds.

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2-ply Eagle brand 108 sq. ft., 60c. 3-ply Eagle brand 108 sq. ft., 90c. Vulcanite Roofing with nails, caps, cement, easy to lay on; requires no coating. 100 square feet #1.75. **GALVANIZED RUBBER ROOFING**, guaranteed for 20 to 30 yrs. No coating required. Price per 107 sq. ft. including nails, caps and cement for laps, 1-ply \$1.50, 2-ply \$1.90, 3-ply \$2.15. Samples furnished FREE.

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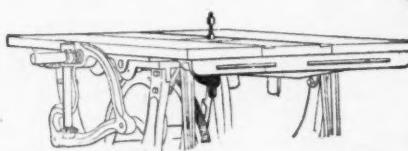
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One Man with the No. 5 Union Combination Self-Feed Rip and Cross-Cut Saw

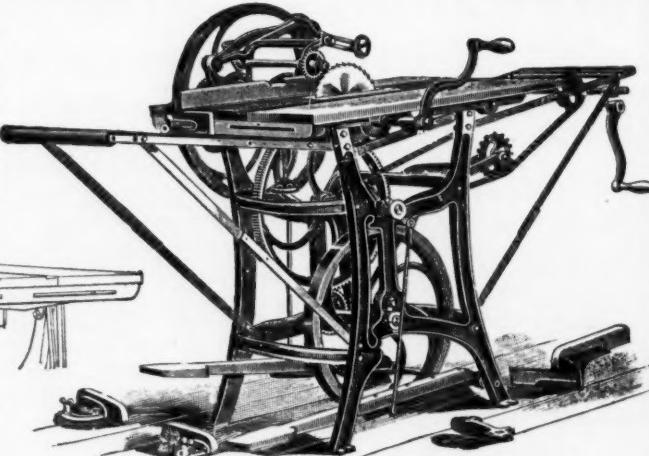
can do the work of four men using hand tools, can do it with ease, can do it better. Consider the amount saved—three men's wages—and compare with the cost of the "Union" saw. In a short time the machine will pay for itself and then the wages saved will go into your pocket.

EVERY MACHINE is carefully tested before leaving factory. We guarantee entire satisfaction and machine may be returned at our expense if, after two week's trial, you prefer your money back.

SUITABLE FOR various kinds of work—ripping, (up to 3½ inches thick), cross-cutting, mitering, etc., and with additional attachments rabbeting, grooving, dadoing, boring, scroll-sawing, edge-moulding, beading, etc., almost a complete workshop in one machine.



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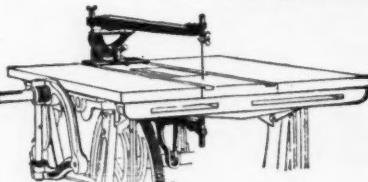


No. 5 "Union" Combination Self-Feed Rip and Cross-Cut Saw.

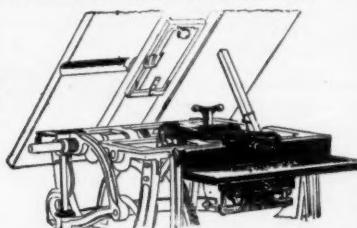
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"Union" Scroll-Saw Attachment.



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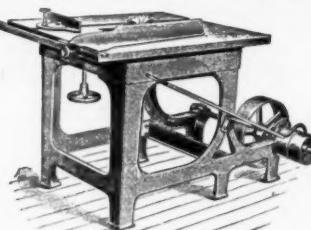
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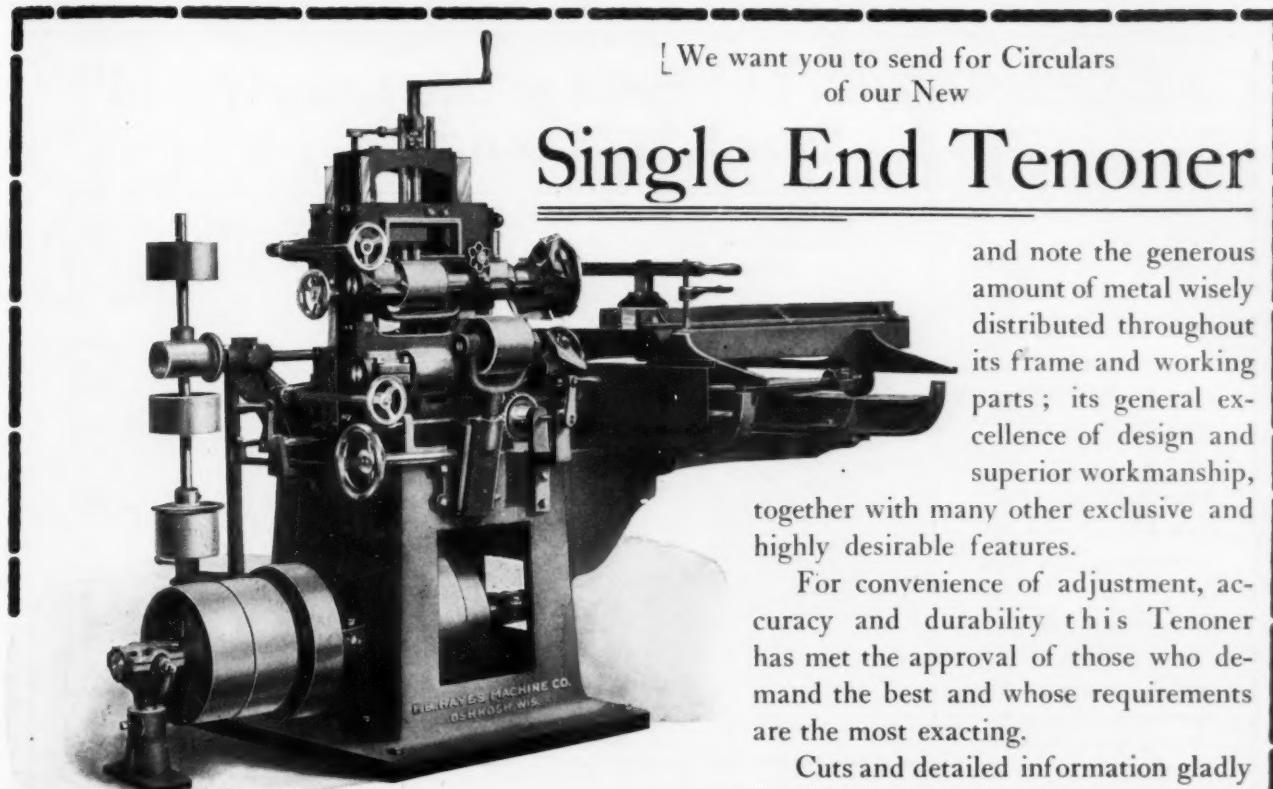
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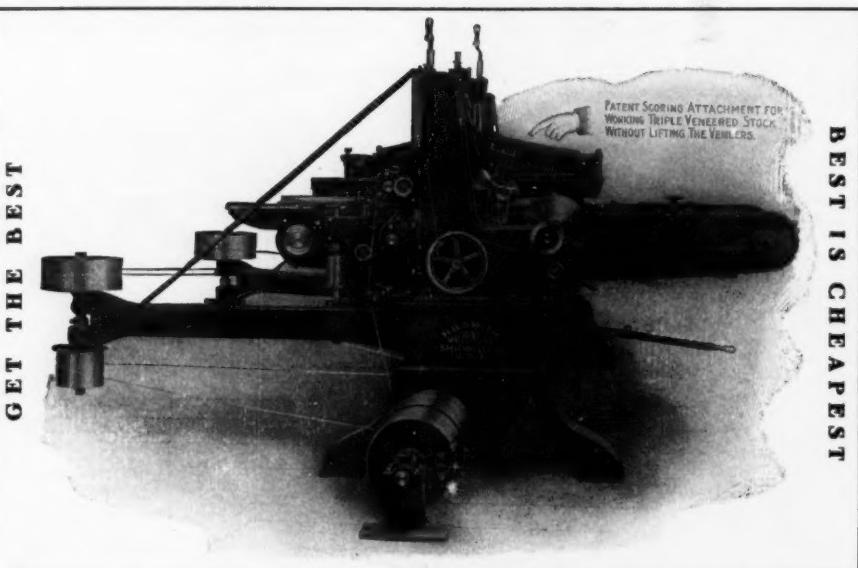
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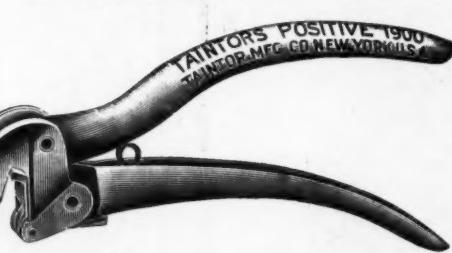
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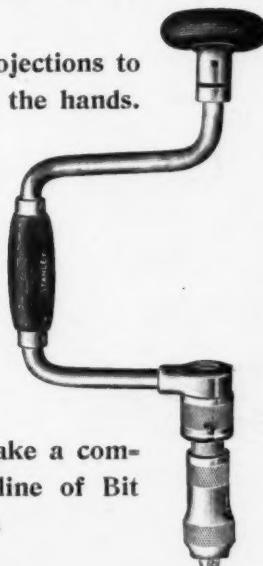


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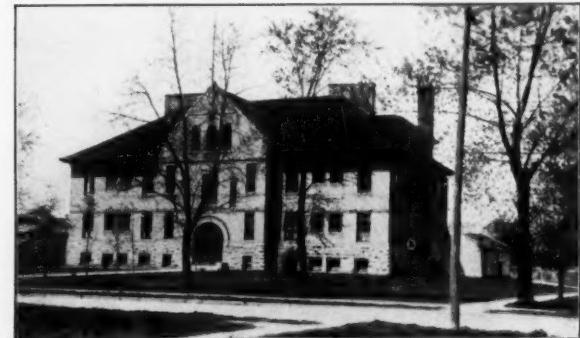
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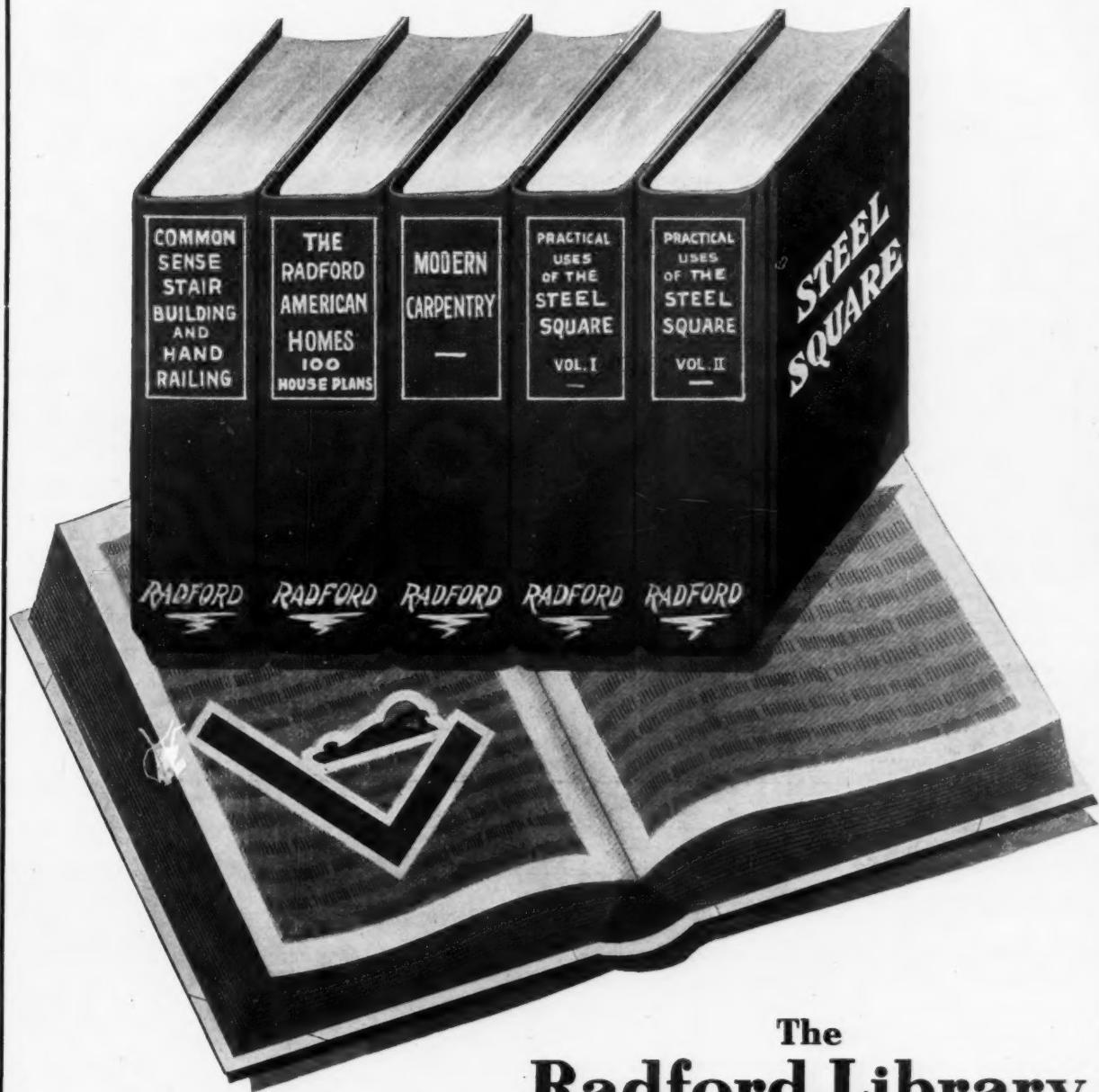


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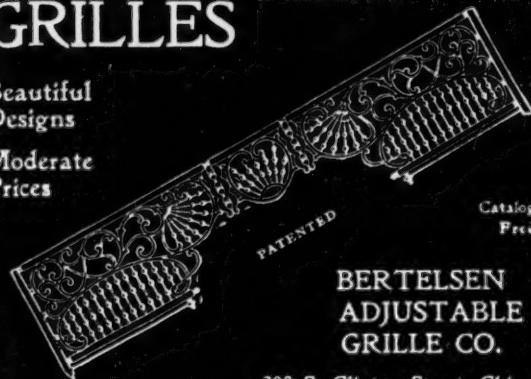
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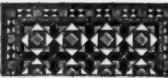
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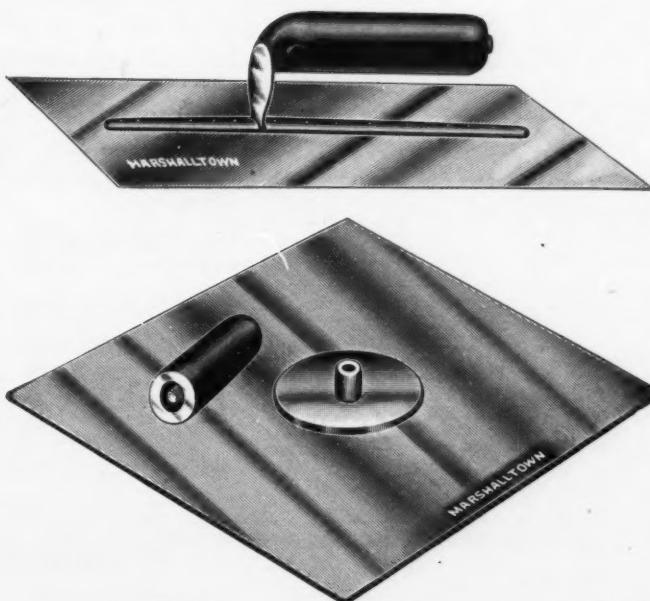
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promptly upon receipt of your
request.

Tower & Lyon Company, 95 Chambers Street, New York

SELF-SETTING PLANE ON 30 DAYS TRIAL

BEST PLANE IN THE WORLD.

ONLY SELF-SETTING PLANE MADE.

HAD AN ADJUSTABLE IRON THROAT.

Set Instantly with Minute Accuracy.

Every fit warranted to stand ham-
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Works every.



It costs nothing to use this plane a month, (where not sold). We deliver
express paid. You return it to us within 30 days as sent, at our expense
and we will send you the whole amount you sent us.

This paper guarantees we will do as we advertise. Send us \$3.00 and
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and we will send it at once.

A MANUFACTURER USING THESE PLANES SAYS:

Philadelphia, July 5th, 1906.

Gage Tool Co., Vineland, N. J.
Gentlemen:—Replies to yours of the 4th inst. making inquiry in regard to our opinions of
your Planes after using them about 15 years, we are pleased to say that we are better satisfied
now than when we first commenced to use them.

We could not really get along without them.

When we take on additional men, we absolutely require them to use the Gage Tool Co.
Plane, as it is the only plane with which we can make a smooth cut over knots and cross grain
pieces.

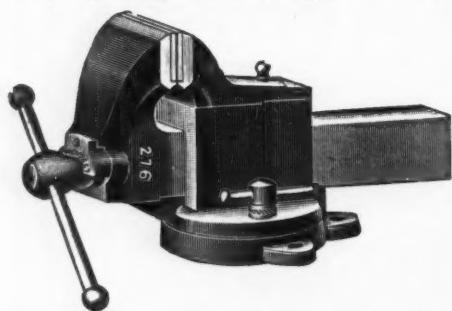
Yours very truly,

G. WOOLFORD WOOD TANK MFG. CO.

(Signed) Geo. Woolford, Pres.

For other information see this paper for May at page 150, July page 399 or write to **GAGE TOOL CO., VINELAND, N. J.**

PARKER VISES

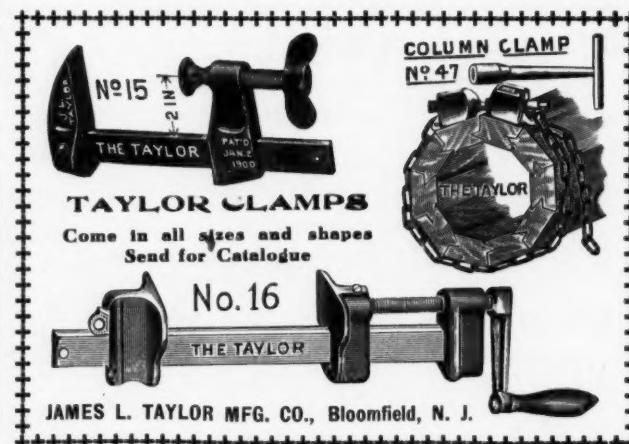


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"Yankee" Quick-Act- ing Lever Vise.

Rapid, Strong, Durable. Best "All-Round" Vise. Self-Adjusting Jaw. Unequalled for Wood-Workers. Holds securely Pipe, Rods, Bolts, Etc.

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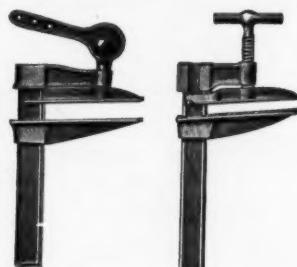
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Steel Bars Any Length Desired

Quick Time
Acting. Saving

Eccentric
and Screw.

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Your roof protects your home!
**Our brand
protects you!**
"Tanner & Co.'s
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Roofing Plates are made by the "Old Style" Process through pure palm oil, which permits the sheets to absorb all the coating they will retain.

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Insist on having the right kind of material on the **outside** of your home, and you will always be comfortable on the **inside**.

Tanner & Company
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IT IS NOT THE FIRST COST

of a metal ceiling that makes it cheap. The cost of a ceiling is not complete until the work is accepted by the architect or owner. If the plates do not fit, your expense may be enormous. Better be

on the safe side and get "Canton" Metal Ceilings. We have a reputation for good work.

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There's Nothing to Fear From the Elements
 when your roof is covered with



ROOFING TIN

In case of fire from without it does not ignite; from within, it soon smothers the flames; wind cannot get under; rain cannot beat through; a snow load—the worst of all pressures—creates no damage, while freezing and hail will not crack or destroy this superior commodity.

Think over all other roof coverings and see if such claims can be truthfully made for any of them, then take into consideration the moderate cost and long life of MF Tin, and decide for yourself which is the most practical material for you to use.

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COMPANY**

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Union Metal Corner Bead No. 2.

A Steel Corner Bead to be efficient must be anti-rust.

UNION METAL CORNER BEADS are double hot galvanized after all perforating and

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NO OTHER CORNER BEAD MANUFACTURER offers a metal corner bead protected from rust in this manner.

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A new device whereby a skylight can be raised or lowered as easily as a weighted window. Constructed of steel and malleable iron, has a movable slide-holder to adjust itself, and can be opened any distance desired. Always locks automatically open or shut. Can be applied to either hipped or flat skylight easily and quickly.

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AGENTS WANTED

Trade "G. B." Mark

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Metal Shingles
Perfect Side Lock.
Rain and Snow Proof.
Always Give Satisfaction.
Write for Prices and Catalog "S."

For—
Architectural Sheet Metal Work,
Galvanized and Copper Cornice,
Roof Gutters,
Curved Mouldings, Skylights, Finials,
Ventilators, all styles Roofing and Siding,
Conductor Pipe, Eave Trough, Etc.
Write for prices and Catalog "G G".

Art Metal Ceilings and Sidewall.
Exclusive and Artistic Designs. Perfect Fitting Plates.
Write for Prices and Catalog "D-D".

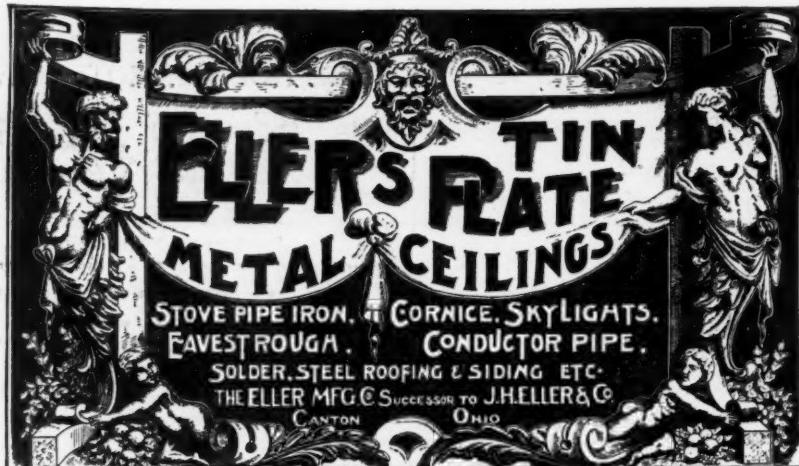
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CANTON, OHIO. MANUFACTURERS.

To put up a ceiling easily, to put it up in the least possible time and at the lowest possible expense, the ceiling plates must fit perfectly. This is one of the strong features of the

**I. S. R. & C. CO.'S
Metal Ceilings**

Designed and modeled, as they are, by an expert, manufactured under the direction of men who have both the mechanical sense and skill to know what constitutes and how to produce a perfect ceiling, and handled from the sheet to the finished product by men particularly qualified in their special branch of the process of manufacture. The I. S. R. & C. Co.'s Metal Ceilings, in points of artistic beauty, close fitting qualities, and all else that go to make a perfect ceiling, are as perfect as human skill can produce. Our catalogue "Metal Ceilings" will tell more about them. It's free upon request.

Indianapolis Steel Roofing & Corrugating Co.
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WATERPROOF AND ODORLESS SHINGLE STAINS

Free from Creosote and all unpleasant odor. Other Stains allow Shingles to take in water and become sopping wet. Dampness is greatest enemy to wood. Our Stains shed water like a "Duck's Back," and provide greatest protection possible to life of wood. Colors artistic and durable.

Parker, Preston & Co.'s Waterproof Flat Brick Stains and Waterproof Brick and Stone Filler
Handsome Cabinet free, containing color sample cards
MANUFACTURED SOLELY BY

PARKER, PRESTON & CO., INC., NORWICH, CONN.



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WANTED: A thousand carpenters that are dissatisfied with their present wages and want to make money easily, write to
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The Edwards Metal Shingles
The Edwards Perfect Hip Shingles
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 The perfect roof combination.

Illustrated and described in our "Shingle Booklet"
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Manufacturers of the most extensive line of
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 By Using
Polygon Pipe
It Excels

all conductors in

Beauty, Strength and
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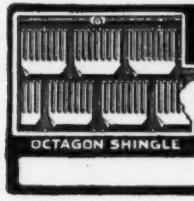
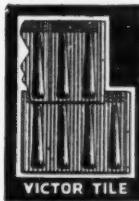
Rain proof Shingles that last Rust proof
 Durable The National Sheet Metal Roofing Co. Ornamental
 WALTERS' SHINGLES. — JERSEY CITY N. J. — WALTERS' TILES
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Cheaper than tin, slate or reshingling. Cooler in summer; warmer in winter; saves
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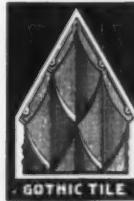
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Do you want to make money laying these shingles?
 If you do send us your name and address, and
 we'll not only tell you how it can be done, but
 help you do it.

Montross Metal Shingle Co. Camden,
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Price, \$1.75

TOPP'S FRAMING TOOL.

A PERFECT TOOL and the only Tool for the purpose ever invented.
 Saves from 3 to 24 hours in laying out a single roof. Saves time for the skilled mechanic, and
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 IT DOES ALL THIS. It is accurate, thus preventing all mistakes. It gives angles for any pitch.
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 Write for circular. Address the manufacturers.

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Steel Plastering Lath
IS THE OLD RELIABLE**

First on the Market and Still Leads

FIREPROOF—STRONGEST—STIFFEST

Expanded Steel for Reinforcement
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NORTHWESTERN EXPANDED
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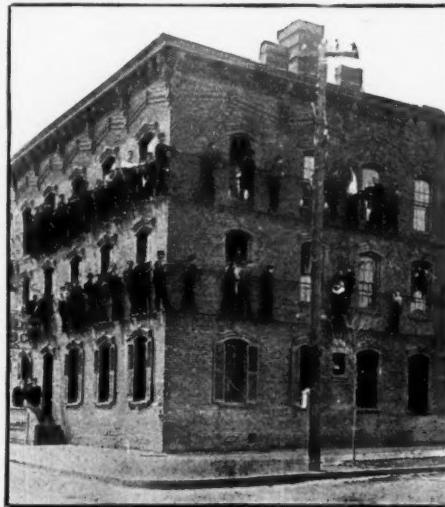
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Cement Plaster
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Wood Fiber Plaster**

The superior brand of Hard Wall Plaster which is made from pure gypsum rock. We have one of the best improved mills and our thorough method of manufacture enables us to turn out a superior product. We are in position to make prompt shipments.

Correspondence solicited.

**The
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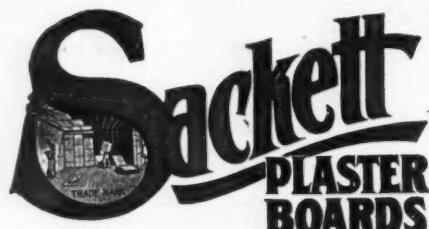
This illustrates a section of a factory building equipped with the

Covert Fire Escape

No other Fire Escape will give the same facilities for quickly vacating a burning building. It is the simplest and most economical permanent Fire Escape now on the market

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A FIRE RESISTANT

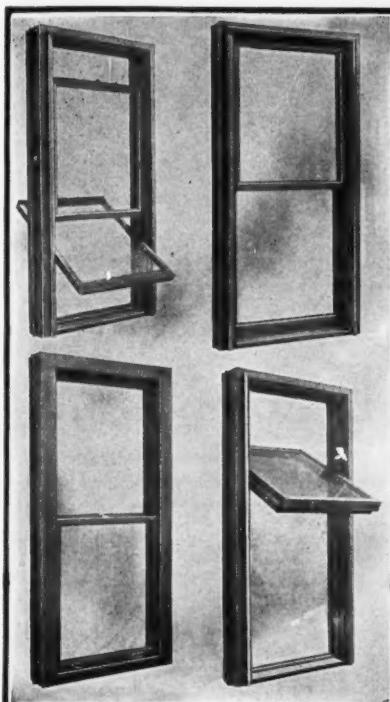
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NAILED DIRECTLY TO STUDDING AND FINISHED WITH PLASTER

Walls and Ceilings constructed with this Plaster Board are economical, light, durable and will not fall. Its use saves weeks of time in construction, as the light finishing required dries quickly. Warmer than lath and cleaner in application. Send for booklet and sample.

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Mullins Fireproof Window



is absolutely fireproof and actually does what no other window can do—it stands every test. Ask for an estimate or write for our convincing catalogue.

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We also make everything in architectural sheet metal work—statuary, skylights, wrought iron grilles, cornices, etc. 120-page catalog of stock designs on request.

"FORSTNER" BRACE AND MACHINE BITS FOR FINE CARPENTER, CABINET AND PATTERN WORK



ing a true polished surface. It is preferable and more expeditious than chisel, gouge, scroll-saw, or lathe tool combined, for core-boxes, fine and delicate patterns, veneers, screen work, scalloping, fancy scroll twist columns, newels, ribbon moulding and mortising, etc.

Manufactured by

THE PROGRESSIVE MFG. CO., Torrington, Conn.

Enquire of your Hardware Dealers or write us direct.

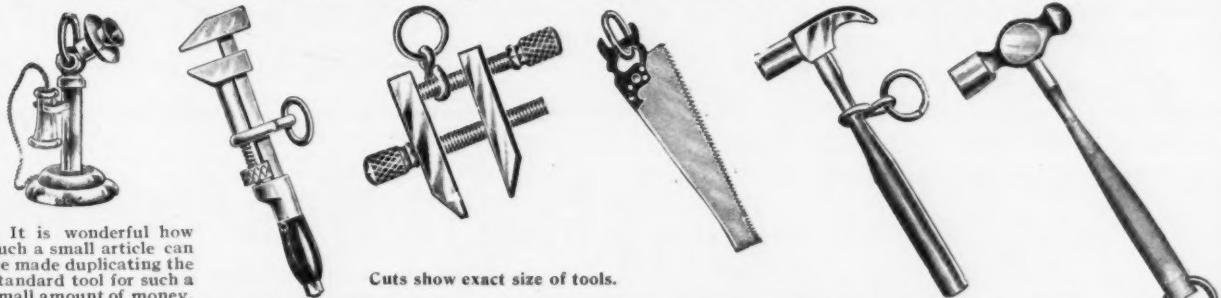
Supplied in sets.

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BEAUTIFUL WATCH CHARMS. EXACT REPRODUCTIONS of the standard tools. No detail is neglected and each one is guaranteed to be exactly as illustrated.



Cuts show exact size of tools.

It is wonderful how such a small article can be made duplicating the standard tool for such a small amount of money.

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**Window Guards, Porch Guards, Stall Guards, Lawn Fences,
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Diamond Wire Web in Rolls or Cut to Order, Any Mesh and Wire, Etc., Etc.**

OUR PATENT AUTOMATIC MACHINERY INSURES LOWEST FACTORY PRICES

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By selling direct from our factory to your cellar we save you middlemen's profits; our price is lower than you can obtain equal quality elsewhere. We offer you our expert skill in planning and placing your furnace, for a furnace is never wholly successful unless properly placed. And

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may smite this beautiful country home, but summer reigns within, for it is perfectly warmed, throughout, by a

Hess Steel Furnace

Every country home, every farm-house may be just as comfortable, and with less fuel and labor than stoves require.

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STRUCTURAL STEEL WORK

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In four sizes from
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Put up in many ways



A thoroughly reliable tool. It bears the mark of
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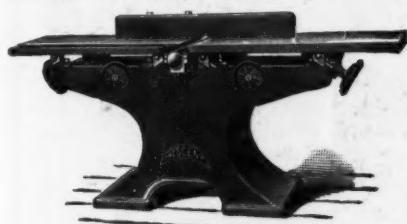
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If not, write for one to-day. It's FREE

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Crescent Jointers Always Give Satisfaction

You may be in a hurry for a job and crowd a CRESCENT JOINTER to the limit of capacity, and get just as good work as though you had not crowded the machine at all.



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You will do the same when you get one.

Catalog describing our elegant line of BAND SAWS, SAW TABLES and JOINTERS mailed on request.

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CALIPERS and DIVIDERS For CARPENTERS



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Buy a Davis & Cook Level



Buy of your dealer—or write us. The Davis & Cook Level is made of better material than any other. Can be used to plumb or level. Has two tubes. Can see them 10 feet away, and in any position—under or over. You know the trouble with the old style bulb-in-the-top levels—useless unless you stand over them. Avoid that trouble. We make them in wood, iron, aluminum. Guaranteed. Ask for Davis & Cook Level.

Davis & Cook, Makers. **13 High Street**
WATERTOWN, NEW YORK

The "Manest"
Flour Box

Better and Cheaper than Wood Bins



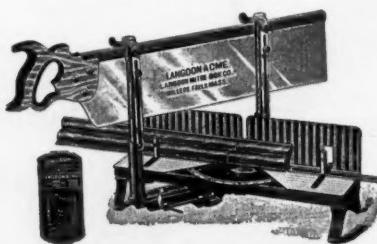
Made of
Tinned
Metal,
Black
Japanned
on Outside.
Fasten on
Inside of
Cupboard
Door.
Proof
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Mice,
Vermin,
Mould and
Dust.

Made in Three Sizes

Send for Descriptive Circular and Prices

The Mannen & Esterly Company
Cleveland, Ohio

We recommend as a perfect tool and one
that will give the utmost satisfaction



The Langdon Acme Mitre Box

This cut shows the Size 2 Box with the saw suspended by the elevators, the moulding held by the supporting guide on one side, and brought against the length gauge on the other.

The bottom boards to this Mitre Box are made of sheet steel, slightly roughened.

The elevators (as shown in cut) may be used for extreme heights or for varying depths for cutting tenons, etc.

The graduated arc indicates all angles. Attached to the box is a metallic index plate, explaining these angles.

The supporting stock guides and length gauge will be found very useful.

Polished parts are nickel plated.

These Boxes are made in three sizes with varying lengths of saws.

Send for catalogue C, giving full description and prices.

MILLERS FALLS CO., No. 28 Warren St., NEW YORK

Goodell Mitre Box

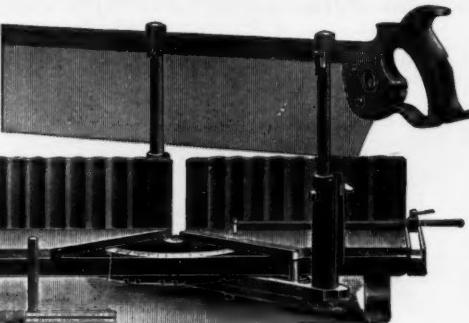
MADE ENTIRELY OF STEEL

NO MORE BREAKING FIRST
in QUALITY and IMPROVEMENTS

Automatic Stops for Holding up Saw. Corrugated Backs. Graduated. Gauge for Duplicate Cuts and many other features

If you want the best you will take no other
Send for Circular C

GOODELL MANUFACTURING COMPANY



Greenfield, Mass.



It Pays to Buy Good
LEVELS

Catalogue Free
Sold by Dealers

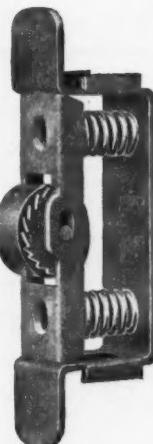
Stratton
Levels are Superior

Stratton Brothers
Greenfield, Mass.

Don't Put Sash Weights in Your Windows! They are Out-of-Date.

THE
"AUTOMATIC" Sash Holder
 IS
 BETTER AND CHEAPER

More Convenient, Less Perplexing, Easier To Put In,
 More Reliable, More Durable, More Satisfactory.

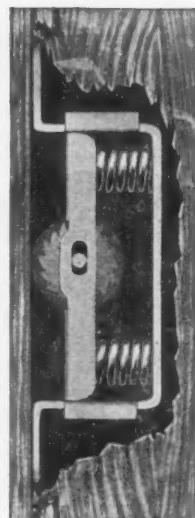


The "Automatic" Sash Holder is the new, modern, up-to-date device that dispenses with cumbersome sash weights, kinking cords or ribbons, useless weight pockets, misfit pulleys and reluctant balances, and saves all the time, labor and expense of fitting them in place.

Architects are specifying them, Contractors and Builders are buying them, Sash and Planing Mills are providing for them, Carpenters are putting them into buildings old and buildings new.

Prevent rattling and permit the window to be moved up and down with ease. Hold it safely at any point desired.

A sample set of four sent postpaid for \$1.20.
 Ask your dealer, or write to us direct.



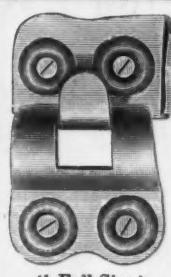
Automatic Sash Holder Co.
 277 Broadway - - - New York City



**PHOENIX
 SLIDING
 BLIND
 CO.**

Phoenix, N. Y.
 Department "C"

**HIGH GRADE
 VENEERED DOORS**



See that Guide Flange?

It makes Storm Windows hung with Gossett Detachable Suspension Hinges easier to hang (no tools or ladder needed), makes them sell—makes them

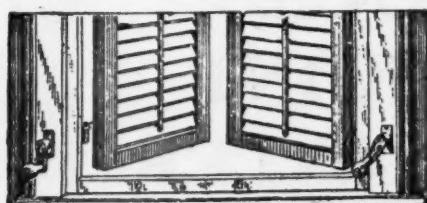
PLEASE YOUR CUSTOMERS

Storm Sash so attached can be opened at the bottom for ventilation.

Write for booklet. Free sample pair if you mention this paper. Sold by dealers in Hardware and Building Material.

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**Standard
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New and im-
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Opens and closes the blinds without raising the window.
 Automatically locks the blinds in any position desired.
 Made of gray and malleable iron. The best and most durable blind hinge. Incomparable for strength, durability and power. Can be ap-
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**Venetian and
 Sliding
 BLINDS
 Screens and
 Screen Doors**

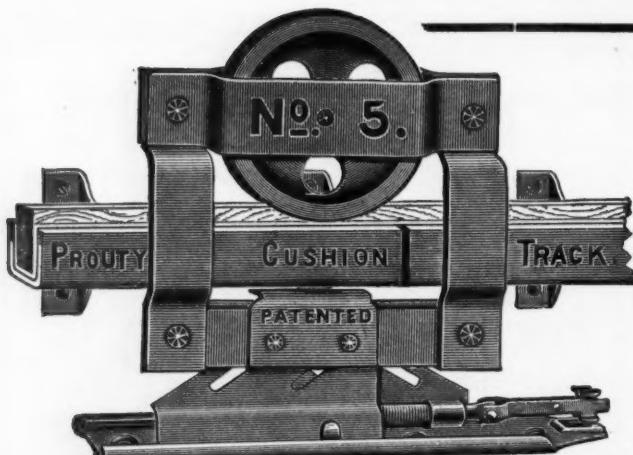


Venetian Blind for
 inside window and
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 Any wood; any
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Sliding Blinds
 for inside use.
 Require no
 pockets. Any
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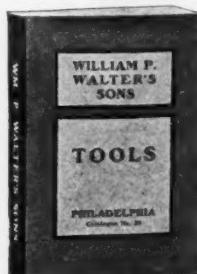
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We want every carpenter and contractor to have one. It contains illustrations and dimensions of the various kinds and styles of Sash Balances we are making.



The majority of the Balances shown are new. We are now making Balances to handle sash with twice the length run ever before made. Send for Catalog A.

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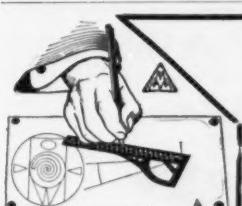
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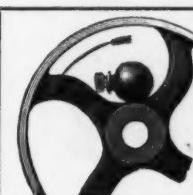
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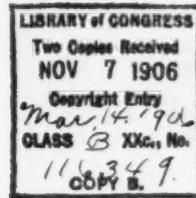
CINCINNATI, OHIO.

The advertisement features the company name "CHICAGO SPRING BUTTS" in large, bold, black letters. Below it, the slogan "A PRODUCT OF RECOGNIZED SUPERIORITY" is displayed. The central focus is on three different hinge products: "Triple-End Spring Butt", "Chicago Spring Butt", and "Chicago Ball-Bearing Floor Hinge". Each product is accompanied by a detailed technical illustration. Three circular "TRADE CSB CO MARK" logos are placed at the top right, bottom left, and center right of the page.

SAVE MONEY

Buy direct of America's great cutlery house:
Get the best quality at lowest possible price.

The image contains a vintage advertisement for Marsh-Langdon miter boxes. At the top, the text reads "The NEW MARSH-LANGDON and IMPROVED MITER BOXES". Below this, a large, detailed illustration of a miter box and square is shown, highlighting its construction and features. The text continues, stating that all have Corrugated Metal Bed Plates, which are ground true, cannot warp or split like thin Wooden Plates. It offers sizes 4 and 40 numbers, and encourages readers to ask their dealer or order one if not in stock. The bottom section provides contact information: "Write for circulars and prices.", "Manufactured only by H. C. Marsh", and the address "606 Race Street Rockford, Illinois".



AMERICAN CARPENTER AND BUILDER.

The Largest, Best and Most Practical Trade Journal in the World for the Carpenter and Builder

American Carpenter and Builder

Entered as second-class matter July 1, 1905, at the postoffice at Chicago, Ill., under the Act of Congress of March 3, 1879.

WILLIAM A. RADFORD, EDITOR-IN-CHIEF.
WILLIAM REUTHER, EDITOR.

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The AMERICAN CARPENTER AND BUILDER is issued promptly on the first of each month. It aims to furnish the latest and the most practical and authoritative information on all matters relating to the carpentry and building trades.

Short practical letters and articles on subjects pertaining to the carpentry and building trades are requested.

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ONE success does not make a man any more than one swallow makes a summer, and occasionally a man wastes valuable time basking in the glory of a success which might be better spent in efforts to attain yet greater things.

Present Building Operations

FOR the first time in some time the building operations show a tendency to materially fall off.

This is undoubtedly due to the great activity along that line during the past few months and the present demands have been filled. This is a state of affairs which naturally results after the unusual activity of the past and building operations will soon be back to normal owing to the prosperous condition of the country.



Carpenters Wanted in Florida

AS we have received numerous inquiries regarding the opportunities of securing work in the South during the winter months, we take pleasure in publishing the following communication which has just come to hand:

TO THE EDITOR:—

Pensacola, Fla.
This city has been the center of a great storm and damage to the extent of three or four million dollars as the result Buildings of all kinds suffered more or less, and mechanics of every kind are kept busy from morning till night. We had quite a boom on before the storm, and could not get carpenters enough to do the work. Now that this extra business is added men cannot be had for love or money. Every winter we have quite a number of good men from your section of the country who come to spend the winter in Florida, and it is always an easy matter for them to make more than expenses while seeing the country. Now, I believe from reading your great building paper (being a charter member) that your greatest aim is to benefit the carpenters in general. I cannot see how you can better do so than by telling them through the pages of the AMERICAN CARPENTER AND BUILDER that this city wants good carpenters and wants them to the extent of paying good wages in one of the healthiest and pleasantest cities of the South. Send stamped envelope and I will answer all letters and guarantee every word I say.

F. M. WILLIAMS,
Secretary Builders' Exchange.



Homelike Homes

THERE are as many different kinds of homes as there are kinds of people and naturally what would appeal to one class would not do at all for the others. The kind of a home that one possesses is largely determined by one's means. A rich man would provide himself with a richly furnished and very expensive house. A poor man must do the best he can, but he would not be comfortable in the home of the rich. This must always be

considered in home building, for the essential thing is to make it a home for the one who is to live in it.



Shop Trade Schools

EVERY thinking employer in the building trades recognizes a serious question that is facing the country: where is our future supply of skilled mechanics to come from? There are far too few boys learning the various building trades, in proportion to the depletion of the ranks of the journeymen by death or by graduation into the class of employers, to fill the present demand for skilled workmen. The great yearly increase in building means that every year the demand for competent mechanics will grow greater, while in many trades the supply is constantly diminishing, and the ranks of the journeymen must necessarily be largely recruited from foreign immigration. The building trades offer far larger opportunities to the bright, industrious American boy than do clerkships in mercantile pursuits, yet the apprenticeship system, in most of these trades, is practically dead. The keen competition of modern business causes the employer to devote most of his time to the business end of his calling. He must give his best efforts to securing new work; to organizing his forces so as to make the most profit upon the contracts which he has on hand, and must pay strict attention to the financial end of his business. In the multitude of his duties he has no time to teach the trade to an apprentice. The journeyman is too often jealous of the apprentice boy, looking upon him as an interloper brought in for the purpose of competing with him and enabling the boss to cut down wages or dispense with the services of the highly paid skilled mechanic. As a consequence, the apprentice, if there be one, gets little instruction and less sympathetic encouragement. He is often compelled to do the "dirty work," that the journeymen dislike to do, and gets little chance to handle tools or really learn the trade. Naturally he grows discouraged and quits the shop, seeking some other field of labor. At the recent meeting of the Master Car and Locomotive Painters' Association, it was very truly said that the intelligent and high school educated boy is not willing to become a scrubber of pots and scraper of grease. "Such work is good enough for a Chinaman," he says. He wants to be given an opportunity to learn the trade from the very start, and to waste no time on mere drudgery that could be better done by some ambitionless day laborer.

Those who have had experience tell us that the trade school is the one thing that will solve this question of our future supply of mechanics. But trade schools are few and far between and until our school boards wake up to the necessity which confronts the nation and establish trade schools as a part of our public school system, we can scarcely expect to have enough of these excellent institutions to supply the ex-

isting need for skilled workmen. Every employer owes it as a duty to his trade to bear some part in training up mechanics to follow in his footsteps, and if there are no trade schools in his town, then he should, either alone or in conjunction with his fellow employers in his trade, found a trade school where boys may be taught to earn an honest livelihood. But, you may say, the average building trade employer has no money to build and endow trade schools. That may be true enough, but he has his own shop which he can use as a school, and he surely can give up one or two evenings every week during the winter months to impart to some bright, intelligent boys that knowledge of the trade which they cannot get while working along with the journeymen. He can teach them how and why each particular operation is done. Instruct them in cutting joints, in mitering, tenoning, dove-tailing, in working from scale drawings, in short he can make them masters of their trade, explaining each step carefully and slowly; not losing patience because the boys seem dumb at first, but guiding them step by step until they really know the trade. And in their daily work he can see that the boys are not condemned to rough work that laborers could do better; that they waste no time driving the horse or "rushing the growler" for the men, but that their tasks are such that they will be allowed to put into practice lessons they have learned in the evening shop school. If there is a local builders' exchange, such a school might take in all the apprentices of a dozen or more employers, and each employer might devote say one night in the week to instruction in that particular branch of the trade in which he personally excels. Sharing the work of instruction would lighten the labor for all.

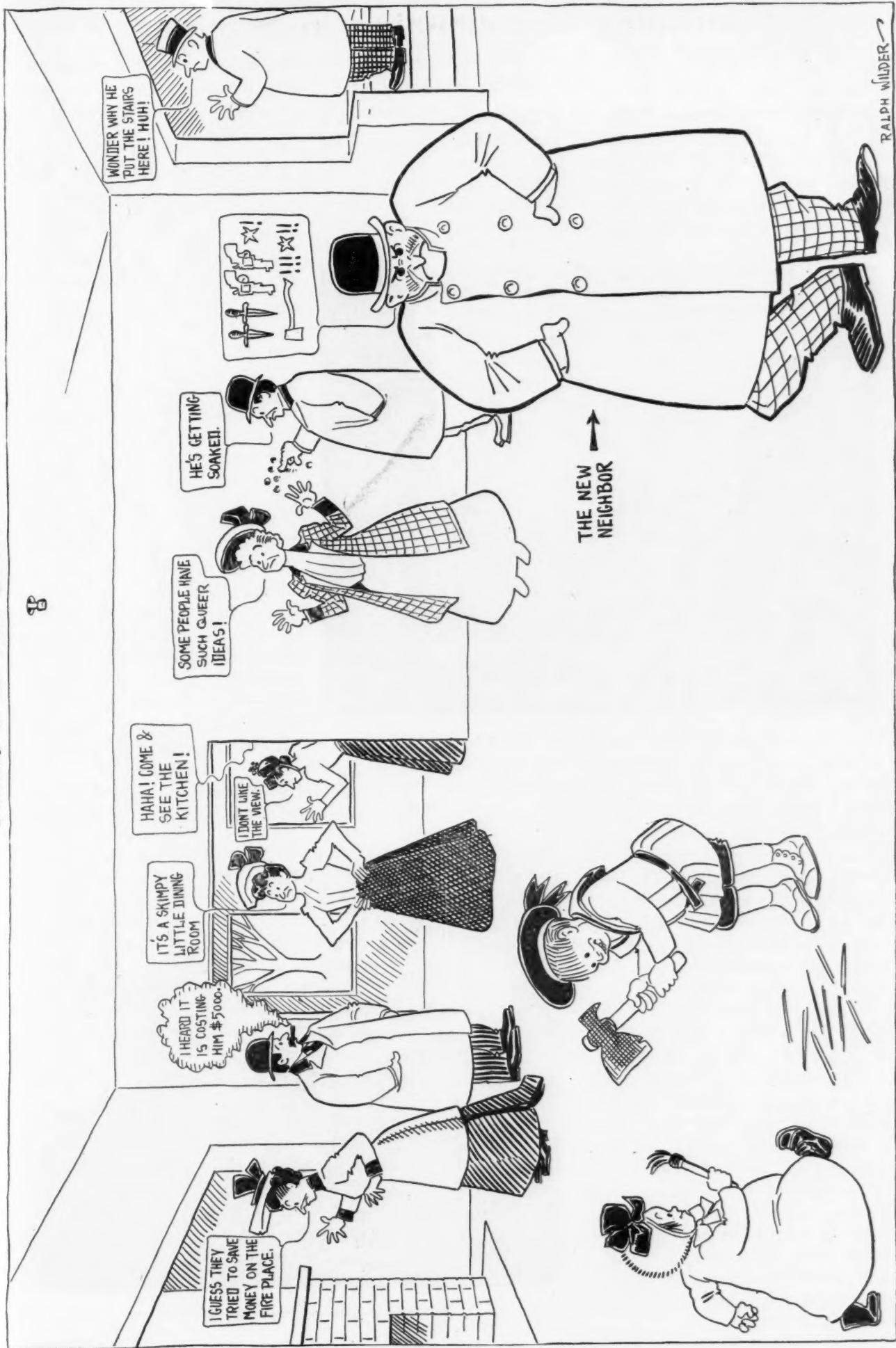
Is this idea of shop trade schools practical? Let us answer this by saying that, for a number of years, it has been successfully carried out by a firm of house painters and decorators in York, Pa., who have established a regular four-years' course of instruction for the apprentices in their shop, giving up two or three evenings a week for six months in the year to this trade school. The apprentices that they graduate are thoroughly competent mechanics and several of them are now filling positions of considerable responsibility. These gentlemen have made a success of the shop trade school and are earning their reward in the consciousness of a work that is well done. They are doing their part in helping to provide American boys with an opportunity to enter the building trades and to earn an honest livelihood for themselves.

Dear Reader, could not you do your part? Have you not enough sense of gratitude to the master who taught you your trade to make you willing to train at least one boy to follow in your footsteps? Could you not induce some of the other employers in your town to co-operate with you and start a shop trade school this winter? Surely you would reap your reward.

EDWARD HURST BROWN.

Sunday at the New House

8



Mr. House Builder (the new neighbor) overhears a few remarks.

Building Construction in Scotland

THIS IS THE FIRST OF A SERIES OF ARTICLES BY OUR SPECIAL REPRESENTATIVES WHO ARE MAKING A TOUR AROUND THE WORLD ON BICYCLES

ONE of the sights of Edinburgh at the present time is a new building in the course of construction on Princes street. The thing that causes the people of the staid Scotch capital to take especial interest in this new building is the fact that the method of erection being followed is that of

land to see huge structures of stone and steel spring up "in a night" as do some of the skyscrapers in up-to-date cities in America. An Edinburgh paper which had a brief account some time ago of this innovation in the building line in its city, remarked in its characteristic dry and encyclopaedic style: "The erection is designed to proceed with a rapidity not at all common amongst us, but rendered possible by the skeleton steel plan of construction adopted. The completion of this edifice will be reached during the year 1907." The cleaning away of a number of small shops which occupied the site previous to the commencement of this building, was begun in May of the present year, and the citizens of Edinburgh are scratching their heads in amazement at the unusual speed which is being made. We wondered what some of these people who stood around and marveled, at what would be considered a very ordinary sight in the states, would have thought had they been present in New York where there is in progress "a skyscraper race" in which over a dozen monstrous buildings—every one larger than this structure—are growing with

the same and even greater rapidity.

This building is to have a frontage of 90 feet on Princes street, the fashionable business street of the



Steel Construction in Scotland

American skeleton steel construction. This is to be the first building in this city in which that method of construction has been followed, and its course is being watched with great interest by people whose daily business takes them past its site. About two weeks ago when we were in Edinburgh, we found that the steel for the first two stories had been put in place, and that the activities of the workmen who were rearing this new styled edifice were being followed by a large crowd of open-mouthed men (and women, too) who stood around and took turns at peeping in through one or another of the various entrance ways in the high board fence, which has been erected around the excavation that was made in preparation for the building.

The one thing that is especially causing surprise, and even almost shocking the conservatism of the inhabitants, is the comparative speed with which the building is going up. It is not at all a usual thing in Scot-



Glasgow's School House Being Cleaned

city, and is to extend along South street and Andrews street for 70 feet. Its site is really one of the most desirable in the city, and the building is to be made a fine example of modern Renaissance architecture, with a tower 130 feet high. It is to be occupied by a large firm of Scotch men's outfitters. The steel construction work is being done by a Glasgow firm, for Glasgow is far in advance of the older city of Edinburgh in the matter of steel and modern construction. There are several large steel framed buildings in the course of construction in Glasgow at the present time.

The interest, almost sensation, being caused in Edinburgh building circles by this introduction of new methods, seems very well to illustrate that Scotch characteristic which is so noticeable in all commercial lines, namely, conservatism. Grates are the invariable form of heating and even cooking in Scotland. The American consul in Glasgow told us that he found it impossible to find office rooms in all the city that were not grate heated. The universal use of grates gives the cities of Scotland a peculiar appearance, for every grate in a building has its own individual smokestack, which comes out of the huge chimneys in the form of a round pipe. These long rows of pipes remind you of a pipe organ, or of a row of whistles. These conditions are not peculiar to any one part of Scotland, but are universal.

All buildings are of stone or brick. We have not seen a frame structure in Edinburgh or Glasgow, or in the country districts through which we have traveled in the past three weeks. Lumber is scarce. What timber there is is usually unavailable, for it is locked up in the hunting preserves of the rich landowners. On the other hand, stone is very easily obtained in most parts of the country. The buildings are not equipped with fire escapes; even the hotels are not so protected. Compared to the structures in large American cities the buildings throughout Scotland are low. "Skyscrapers" are comparatively unknown, and an eight-story structure is about the limit. Everything has an air of solidity about it, for the Scotchman builds slowly, and for all time.

One of the most magnificent buildings in Glasgow, and one which will serve very well to illustrate the attention which is given to the question of making buildings sightly, as well as useful, is the "St. Vincent's United Free Church." Like most public buildings in Scotland, it is built solidly; there are blocks of stone in its foundations at least six feet long and nearly as thick. This building was constructed nearly fifty years ago, on a site which was then at the extreme western edge of the city, but which is now in the very heart of it. It cost £26,000, or about \$130,000. That was over fifty years ago, however, and we were told that it could not be duplicated for over twice that sum to-day. From an architectural point of view it is undoubtedly the most remarkable modern building in the country. It is a detailed imitation of the Greek Ionic

style. But there are also frequent suggestions of the Egyptian style of temple building. This is especially noticeable in the interior, where the Egyptian acanthus, pillar and doorway are prominent. A stranger is forcibly impressed upon first viewing it, despite the fact that fifty years of existence in a smoky city, have blackened its face with grime and age.

A new idea for the cleaning of stone buildings has been evolved in Glasgow, and one which promises to do away with the many tedious processes which have been used. America might well adopt it for use on its public buildings, which are now given a bath with Sapolio or Gold Dust every few years.

This idea is the cutting away, by means of steam hammers, a coating of the stone. A layer of about one-eighth of an inch in thickness is removed—and at the conclusion of the work the building looks like a new one.

We stumbled upon a place where a building was being "cleaned," and after deciding that here was something novel, we had a talk with the man in charge of the proceedings. He was very glad to answer our questions, and from him we learned that this was the second building to be cleaned in this manner—the first building proved that the theory was practicable. One man armed with a steam hammer—Yankee make, by the way—can do the work of three men employed in cleaning the building in the old manner. Our photograph of the operation shows very clearly what is accomplished by the steam hammer. The white portions of the building, which, by the way, is one of Glasgow's schoolhouses, being those which have been cleaned. The difference in color is strongly marked on the tower and near the wing, which look as though they had been partially whitewashed.

Our other picture brings out several points. One of them is the steel construction commonly used here, extending only to the first story; another is the manner of scaffolding and operation of the derricks; and lastly the way in which sign boards are erected to conceal the chaos within. This scene is on one of Glasgow's principal business streets.

LESTER R. CREUTZ.

GEORGE E. HOLT.



Quite Providential

Mr. Smith—I believe there is a special Providence which protects carpenters. Do you know that only yesterday one slipped off a forty-foot ladder and was not hurt in the slightest degree?"

"That sounds almost miraculous," said Mrs. Smith.

"Oh, no; there was nothing marvelous about it; he slipped off the first rung."



You are generally well informed as to who gets the most pay in the factory, but what all the rest are kept wondering about is how it comes that he gets it.

The French Plaster Industry

BY WALDON FAWCETT

NOW that the building and engineering world is devoting so much attention to concrete construction there is an awakening interest in the sources and processes productive of plaster. Plaster has, for a long time past, played a very important part in building construction, but of late there has been a notable expansion of the industry since the increase in the use of concrete has brought about an enlarged demand for plaster, which latter is introduced in cement

Particularly is the French product valued for the making of casts and similar products.

Three different methods are employed in the working or mining of the Paris plaster deposits, namely, open-air quarrying, the utilization of subterranean galleries and the employment of shafts. Each of these general classes of operations embraces a number of different methods, varying considerably in detail. Worthy of first consideration are the various schemes



General View of Plaster Mine in France

in greater or less proportion in order to control the speed of the setting of the material.

The plaster industry is to be seen at its best in France, where, in the vicinity of Paris is to be found the most extensive and most important plaster-producing region in the world. This valuable construction material is obtained by the calcination of gypsum or sulphate of lime, vast beds of which are to be found in the neighborhood of the French capital, particularly on the banks of the Seine River. Gypsum is also found in England, Germany, Greece, Italy and the United States, but the deposits in the basin of Paris, which occur in three beds lying above a sandstone or grit, constitute the world's chief source of supply.

of open-air quarrying resorted to in working the uppermost gypsum strata,—known technically as the “first” or “high” bed,—and which is decidedly the heaviest and richest of the deposits. This “vein” of gypsum which in not a few instances lies directly under tillable soil and is consequently easy of access has in some places a thickness of sixty feet or more, so that it can be appreciated that operations of considerable magnitude are possible.

An approved method of open-air quarrying is that by means of “benches.” By this plan the gypsum is first stripped of its coverlet of soil and then the rock is removed, beginning, of course, at the top. Much of the rock is dislodged by blasting and so soft is the

deposit that the holes for blasting purposes are bored with an auger. These holes range from seven to fifteen feet in depth and the force of an explosion throws down enormous quantities of material which is broken up after it has fallen. The removal of the de-

rock is broken down step by step. Much of the work is prosecuted with difficulty, for often the miner must lie flat upon his back, his range of operations extending only so far as he can reach with his pick handle. Eventually, of course, blasts are employed and a large passage opened, after which the debris is removed and permanent oak timbering is introduced.

The lowest strata of gypsum oftentimes requires, for its successful working, some form of shaft mining. This class of operations is not as extensive as the others referred to and primitive methods are yet in vogue for hoisting the mined blocks. After the gypsum, mined by any of the methods cited, has been broken into pieces it is calcined to remove the water of crystallization and thus transform it into plaster, which is further ground.

As may be imagined, the roasting is a most important step in the evolution of this product and must be carried on at a temperature of from 80 to 200 degrees C., since any temperature below or above the limitations



Slaking Quick Lime

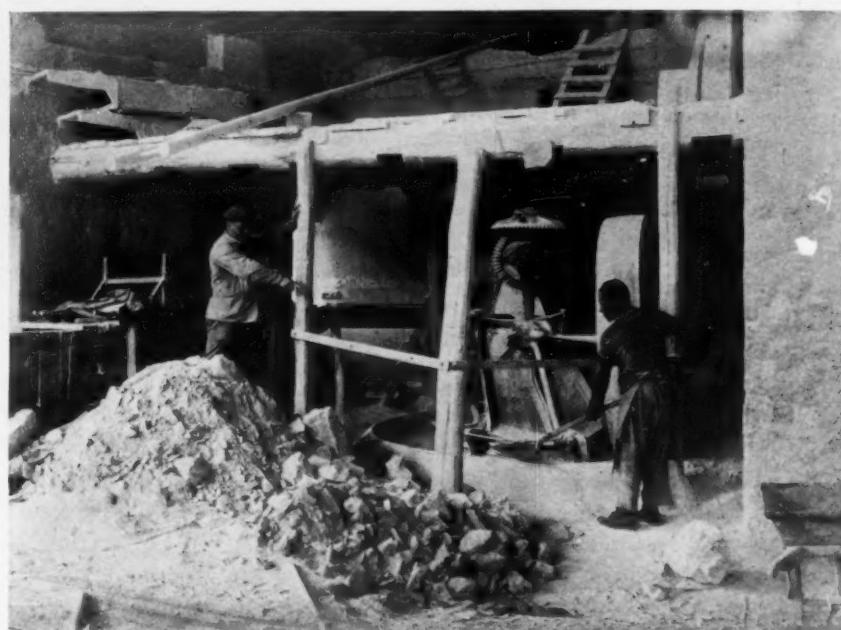
tached material is accomplished by means of dump cars operated on a narrow gauge track.

The second method of open-cut mining is in a sense a modification of that above described and involves undercutting as its distinctive operation. After the highest stratum of the deposit has been exposed the marl separating it from the next lower layer is cut away, the upper mass being supported meanwhile by the aid of props. When a considerable area has been thus undermined, holes are bored and blasts placed in the pillars or props which have been provided as supports. The simultaneous discharge of these blasts serves to throw down the entire expanse of material, as much as 6,000 to 7,000 cubic yards of the gypsum sometimes being precipitated in a single operation.

Decidedly picturesque are the mining operations in which subterranean galleries are employed. The openings of the tunnels or drifts appear at intervals on the slope of the beds like series of gigantic doorways. The walls of these galleries rise obliquely and form a pointed arch that serves as a natural roof, being further strengthened by heavy timbering. In these drifts the

given results in a product that is inert and incapable of absorbing water or of setting when used in construction.

The roasting is carried on under crude shelters de-



Grinding the Roasted Plaster

signed to protect the material from the rain. The "furnace" is constructed of the gypsum blocks themselves, the larger pieces being placed at the base, arranged in the form of arches, while upon these is deposited the fuel, consisting of wood, coal or coke, and

above is built a superstructure formed from the smaller pieces. Passages are, of course, provided for the escape of the smoke and vapor. The roasting of a quantity of, say, five hundred cubic yards of rock requires not less than ten hours, and as the operation progresses sheet iron is placed over the arches to prevent or in any event lessen the loss of heat by radiation. Four workmen are required to conduct the roasting of the quantity of material above mentioned. Two of the operatives build, manage and draw the fires while the remaining attendants place the material in position and later haul it away.

Five or six days are allowed to elapse after the roasting process in order that the rock may become thoroughly cooled and then it is pulverized. In the early days of the industry this crushing was accomplished by spreading the material on the ground and beating it with a tool specially devised for the purpose, but with the extension of the industry this primitive process has become obsolete. Nowadays there is employed a type of steel mill revolving in a circular trough with a perforated bottom. In some instances such a mill is equipped with a bucket conveyor which carries the pulverized material to a central screen. In passing over this network that portion of the material which has been pulverized in the requisite degree sifts through the meshes, whereas the remainder is returned to the bed of the mill for further treatment. By varying the screens used any desired degree of fineness may be secured, in accordance with the demands of the work in which the plaster is to be employed.

The process of manufacture is virtually the same

both in the case of plaster designed for construction work and that intended for statuary or architectural decorative purposes, but in the case of the latter exceptional care is exercised at every step in the preparation. First of all, the gypsum which is to serve as a foundation for such material is selected with especial care and is then air-dried for several months. After this it is broken into pieces by workmen using hammers and roasting is effected by thrusting fragments held on long spades into a furnace similar to a baker's oven. Then the next step is the pulverizing, and then the plaster is screened through hair or silk bolting cloth, insuring naught but the most minute particles.

Considerable quantities of plaster are roasted a second time with an admixture of alum in order to produce the aluminated plaster

which is an alternative for ground plaster mixed with strong glue as a material for stucco work. A plaster thus prepared is susceptible of high polish and by the introduction of various metallic oxides can be made to imitate any of the shades of marble.

Preparatory to shipment the pulverized plaster is carried up and deposited on a second-story level from which chutes lead to the ground floor. A sack attached to the mouth of one of these tubes is quickly filled and the flow of plaster is easily regulated by means of sliding gates. Some idea of the magnitude of the plaster industry of France may be formed from the fact that not less than eighty corporations are actively engaged in the field and they employ in the aggregate upward of six thousand workmen and produce annually one and one-half million cubic yards of the



Roasting Gypsum to Produce Plaster of Paris

material. In some instances the lime industry is carried on in conjunction with the production of plaster. For this kilns lined with firebrick are provided and in many instances they have special openings which permit of the withdrawal of the charge without the necessity of extinguishing the fire.

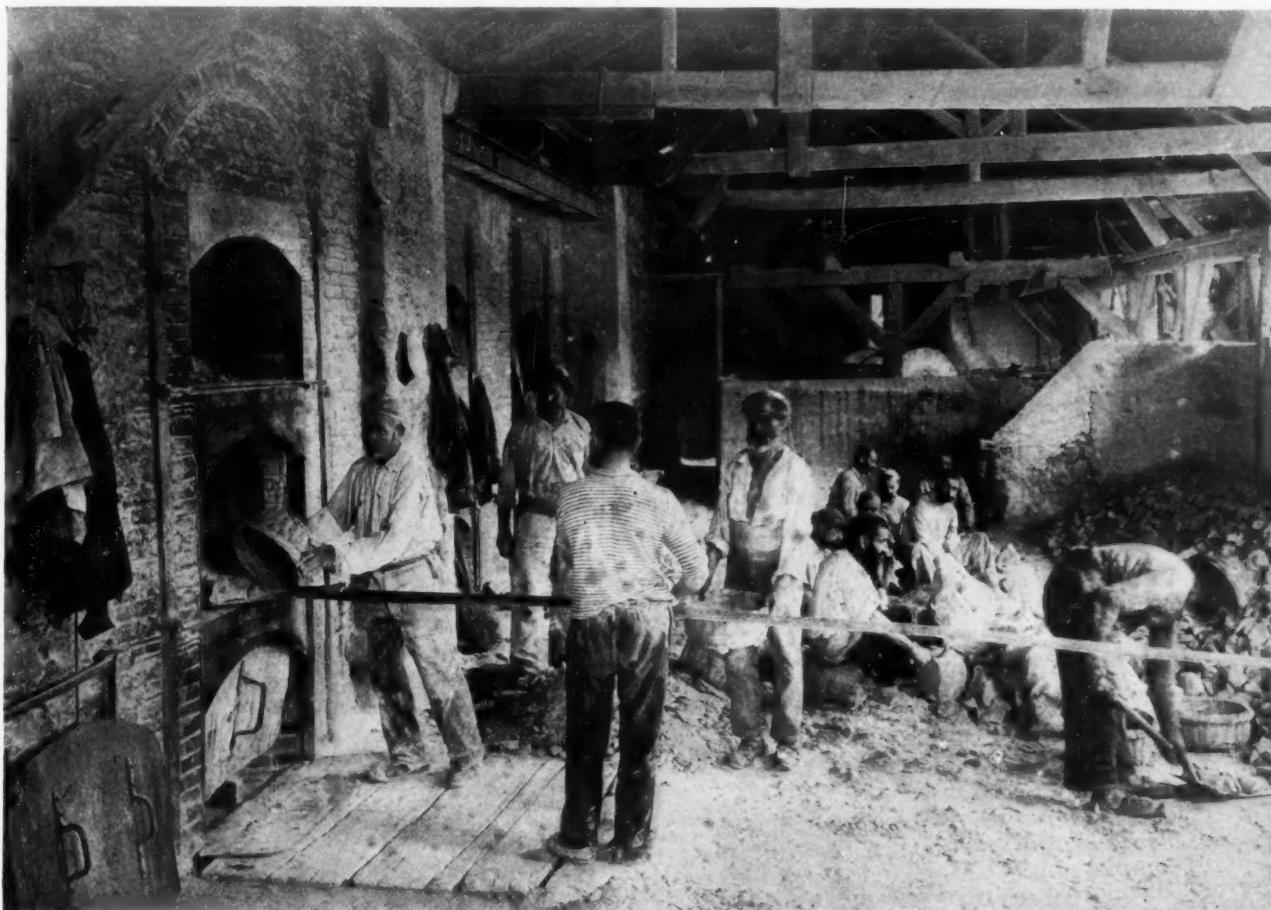


Lumber in Honduras

Consul D. R. Wood, writing from Ceiba, says the receipt of quite a number of letters regarding the

from here should show a decided increase in the next few years.

At present there does not appear to be any way to utilize the pine timber resources of Honduras—as the pine is found mostly in the interior—until the country is provided with transportation by railroads. Still, this day may not be a long way off, as short railroads and tramways, intended for transportation of bananas, have been built and are in operation in many places on the coast, and after the coast is furnished with ample



Making Moulding Plaster

prospect of developing the timber lands of Honduras show that the people interested in the lumber industry in the United States are beginning to look abroad, where there are enormous tracts yet untouched by the ax, for a future supply. The consul adds:

There are in the interior of this country large tracts of pine lands of virgin forest. A few sawmills are in operation, but their production is very small. All of the lumber used in this town and vicinity for building and construction purposes is imported from the United States, mostly through southern ports. A small amount of the mahogany, cedar, and other hard woods has been cut near the rivers. Many concessions for exploiting mahogany lands in this district have recently been granted by the Honduras government, and short tramways are being planned to get out the logs. The exportation of mahogany

transportation facilities it will not be such a difficult matter to make extensions to tap the interior.



The average man generally aims right, but the trouble is, sometimes he don't get down in his hind sights right. He tries to use a blunderbuss for rifle shooting, a revolver for a shot gun, or makes some other mistake to queer his work.



Try saying something good about somebody every day, and in a little while you will be surprised how many good men there are in the world.



You have a place in the world. Find it. You can win in no other way.

Pennsylvania State Capitol

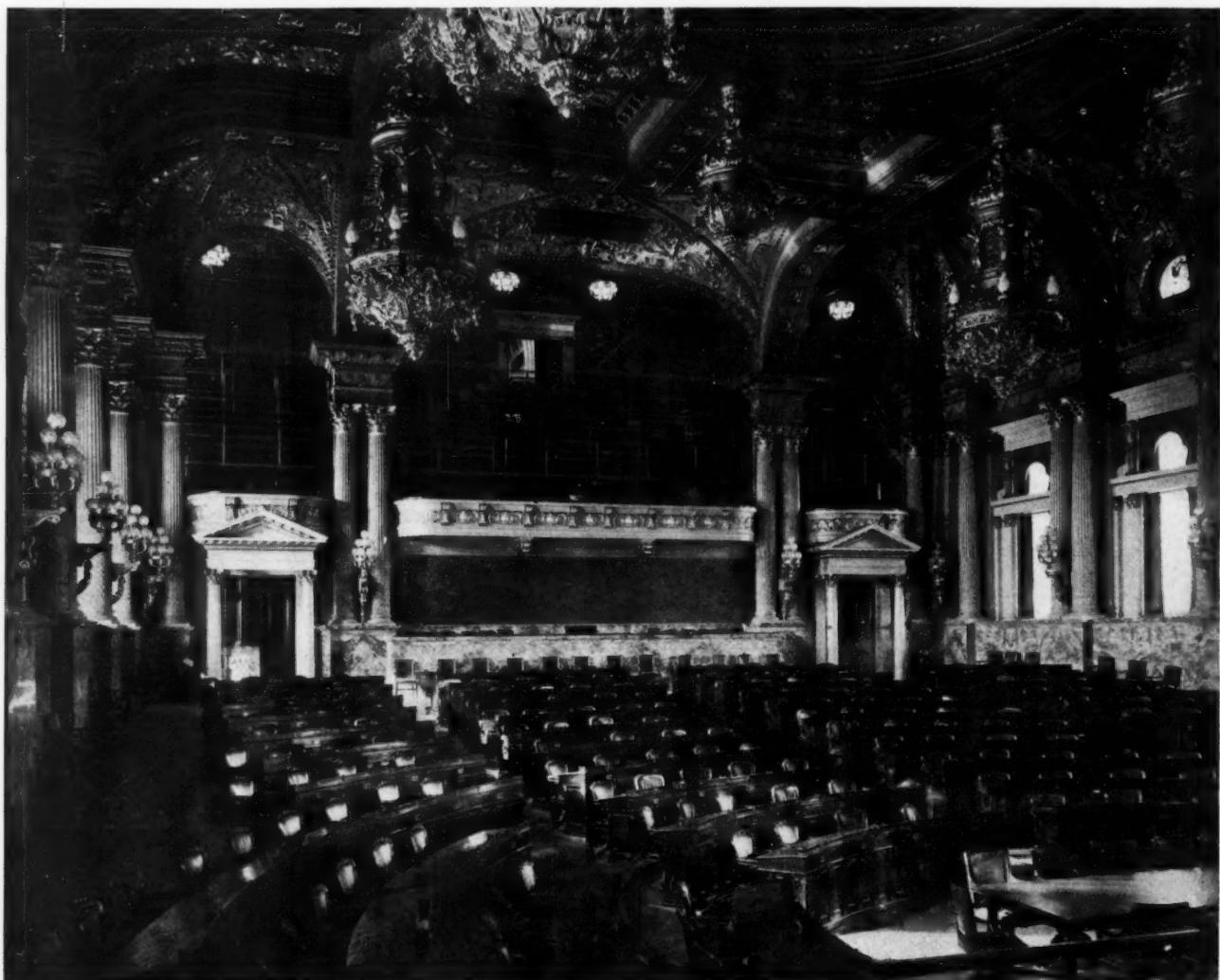
SOME OF THE MORE IMPORTANT FEATURES OF ONE OF THE MOST ELABORATE AND MOST FAMOUS PUBLIC BUILDINGS IN THIS COUNTRY

By Livy S. Richard

THE new Capitol of Pennsylvania, which President Roosevelt dedicated on October 4, is one of the handsomest public buildings in America. A picture of the exterior appears on our front cover, and one of the interior views is shown herewith.

The building is Roman-Corinthian in its general design and is constructed of steel and brick and faced

on the second floor, elaborate doorways lead into the Senate and House chamber on either side. These chambers are most elaborately decorated—the Senate in green and gold; the House in blue and gold. In the windows of each chamber the American flag is worked in colors in glass. The most striking feature of the external ornamentation is the employment of 32 granite monoliths, each weighing 35 tons.



One of the Interior Views of the Pennsylvania State Capitol

with Barre granite. It covers a trifle more than two acres. It consists of a main building and two wings, the total length being 525 feet and the breadth 245 feet. In the middle is a dome rising 292 feet above the first floor. The interior of the dome is decorated in gold, cream and blue. At the top there is a patch of sky, studded with glittering stars.

Two great corridors lead off from the rotunda to various suites of offices. From the rotunda gallery

The building contains 481 rooms and more floor space than either the capitol at Washington or the capitol at Albany. It will house all departments of the Pennsylvania government, including the Supreme and Superior courts.

The building was designed by Joseph M. Huston and built by George F. Payne & Co., both of Philadelphia. The mural decorations are by Edwin A. Abbey and Violet Oakley and the more than 400

statues illustrative of the political, natural and industrial history of the state are by George Gray Barnard.

An acute controversy has arisen over the cost. When the old capitol was burned, in February, 1897, the Legislature, then in session, appropriated \$550,000 for the preliminary work of erecting a new building. The Legislature of 1901 appropriated \$4,000,000 more. This was for the finished building, with mural decorations, but without furnishings. The building was "finished" and its walls were painted inside these appropriations, under the supervision of a special commission, headed by former Governor Wm. A. Stone; and much exultant publicity was given to this fact.

The furnishings came under the supervision of the Board of Public Grounds and Buildings, consisting of the governor, auditor-general and state treasurer, and were not regulated by a specific appropriation, but by a general clause in an appropriation bill empowering it to make "repairs, alterations and improvements," including "furnishing and refurnishing," and to use, in so doing, money in the treasury not otherwise appropriated. Under this authority the board spent over \$9,000,000, or twice the build-

ing's cost. While spent according to forms of law, this large expenditure was practically unknown to the public until revealed during the present political campaign, when it made a sensation.

Some of the items widely discussed are \$1,534.860.20 for fireproof filing cases; \$876,066.40 for desks, chairs, tables, etc.; \$889,940 for carved panels, wainscoting, mantels and designed woodwork; \$138,787.09 for bacarat cut glass panels; \$278,109.47 for marble wainscoting, mantels and bases; \$779,472.96 for raised ornamentation, gilding, decorating and painting; \$32,079.20 for designed clocks and clock fittings, and \$2,049,522.96 for monumental art bronze standards, electric chandeliers and brackets. This last item has been especially criticized, attention being called to the fact that it is 26 times as much as the cost of the chandeliers and fixtures in the capitol at St. Paul and more than 20 times the cost of the art chandeliers and fixtures in the Library of Congress at Washington. The present state treasurer, who was not in office when most of these bills were paid, says there was at least \$5,000,000 of waste or "graft," and refuses to honor further warrants. Both parties in Pennsylvania are demanding an investigation.

Work-Shop Suggestions

USEFUL IDEAS WITH REGARD TO WORK IN THE CARPENTER SHOP—BEST METHOD OF USING AND TAKING CARE OF TOOLS

By A. G. Beard

MY DEAR carpenter friends, don't read this if you are more than forty (in exceptional cases you may be ten or fifteen years younger), as the following remarks are only applicable to the younger members of the fraternity—to those who are still trying to master the trade, and who, I have every reason to believe, let no opportunity nor advice from older heads pass without at least stopping to think as to what there is in it.

If you are a "shop hand," working at the bench, do you think only of that slowly creeping hour hand on the clock, or your watch—which latter you consult nearly every time you see the boss' back turned? Are you really and truly interested in what you are doing? Do you stop your work each time a customer comes in and listen to what is being said, or "butt in" when not called upon? Are you paid for doing this? If so, I apologize; you are an exception to the general run of "Jours."

Habit of Story Telling

Another habit that some young workmen (and I am sorry to say a few older ones) sometimes acquire is that of stopping work in order to tell a story, or discuss some political, economic or social question. Again, are you paid to employ your working hours in this manner? Is it stipulated in your agreement with your employer that you may have a recess of a

certain number of minutes during each working hour.

If you had taken even a nickle from your employer's till, without his consent, you are a thief, liable to arrest, conviction and fine or imprisonment. Do you ever stop to think of how many nickels' worth of time you have stolen when your boss' back was turned? But the losses of your employer from this petty larceny of time is very small in comparison to the loss to yourself. Do not, for an instant, let yourself be misled by thinking that you will not be discovered. A habit once acquired may become chronic, and the final result of your thoughtlessness may be your discharge, and be compelled to knock about from pillar to post and soon obtain the sobriquet of "The-Man-Who-Talks-Too-Much."

Granting that a social intercourse might not retard the work in hand, yet, to say the least, it is liable to distract one's attention, perhaps at a time when the mind ought to be concentrated on the piece of work being done, in order to avoid the possibility of making a mistake. Apropos of this I call to mind a case where two men, at opposite sides of a work bench, were jointing some pieces, working to a gauge mark. Both were good workmen and social companions, but let us look at the results of trying to work and tell stories: Many of the pieces they had gotten out were too small to fill the bill, as, during their occasional

glances at each other, they had dressed out their gauge marks unnoticed.

Use and Care of Tools

Generally speaking, a good mechanic prides himself on the accuracy of his tools. His motto is, "The best is none too good." He may, or may not, have a large assortment, but those that he has are the best obtainable for his needs. His saws bear the stamp of a reliable maker; his planes the improved adjustable iron or a combination of iron and wood; his try-square solid steel, and, what the name implies, "square." But there are others who, either from choice or necessity, have old style wood planes, brass-bound try-squares and other tools which, if kept in proper order, will do good work. It is to the owners of this last class of tools that I dedicate the following:

Let us watch a certain man using his try-square while jointing a board. I never could see the sense of testing the accuracy of the work by sliding the square along the piece, as this man does. If the blade had a cutting edge there might be some sort of apology for so doing, but it has not, and is merely intended to "try" the work as to whether or not it is true. Would it not be a saving of wear and tear on a tool that ought to be kept in perfect order, to merely try the piece lightly at several places, with the stock of the square held firmly against the side of the board. I have seen some of these try-squares so badly worn by this sliding process as to be absolutely unreliable, while the owner, apparently, took it for granted that it was true because it was all right when he bought it.

Many years ago I received a sort of a left-handed compliment from a fellow workman and one that I have never forgotten. We were rabbeting some door jambs at the time, my partner using one of the old-style single iron skew rabbet planes, while mine was one that I made out of a block of stove wood. It had a capped iron, worked easily, and made a shaving like a ribbon of silk, instead of ricocheting over the piece, like the tool my friend was using. Having set my plane on the bench for a moment, he picked it up, took a few strokes, and handed it back to me with this remark: "Any old fool could do a good job with such a tool as that."

The point that I wish to illustrate is that, even though a tool is of a crude or home-made pattern, yet it can be made to do good work if kept in proper condition. I have made one of those single iron rabbet planes work fairly well by giving the iron a slight bevel on the upper edge.

Now, a few words as to the care of wooden planes in general. Those tools, in order to do good work, must have their faces perfectly true, straight and out of wind. Especial attention should be given to the jointer and smooth plane, so that, as was said to me, "Any old fool could do a good job with them." The face of your plane may not be straight; perhaps it is winding; the throat may have become so enlarged by

successive jointing that it requires bushing, or the cap may not fit the bit as it should. With any of these imperfections in the plane it is impossible to do good work. Then what must be said of the man whose planes show all of the defects above mentioned?

There are many traits of the young workman that are soon noticed by his employer. If he is careless in the matter of keeping his tools in order he is soon set down as one who will also become uninterested in his work, and it follows, as a natural sequence that he is slated for an early lay-off. It is the man who is intelligent, studious, methodical and orderly that gets to the front. The slouch is soon crowded to the wall, and his place filled by a man who knows how to keep things in order.



Coal From River Bed

Those who claim that the coal measures of this country will shortly be exhausted may take a little heart from the circumstance that a very good quality of coal is now being taken from the bed of the Des Moines river, at Fort Dodge, Iowa. Recently, owing to the low stage of the water, large quantities of the best grade of coal have been taken from the river and stored against the demands of the coming winter. The coal thus secured, upon which no royalty was paid, was not jetsam from passing coal barges, but was taken from veins that pass through the river at a point just below the city. No one has ever gone on record as laying claim to the coal, and while it was quite generally known to exist there has been no move toward removing or using it. A large amount of coal was thus recovered.

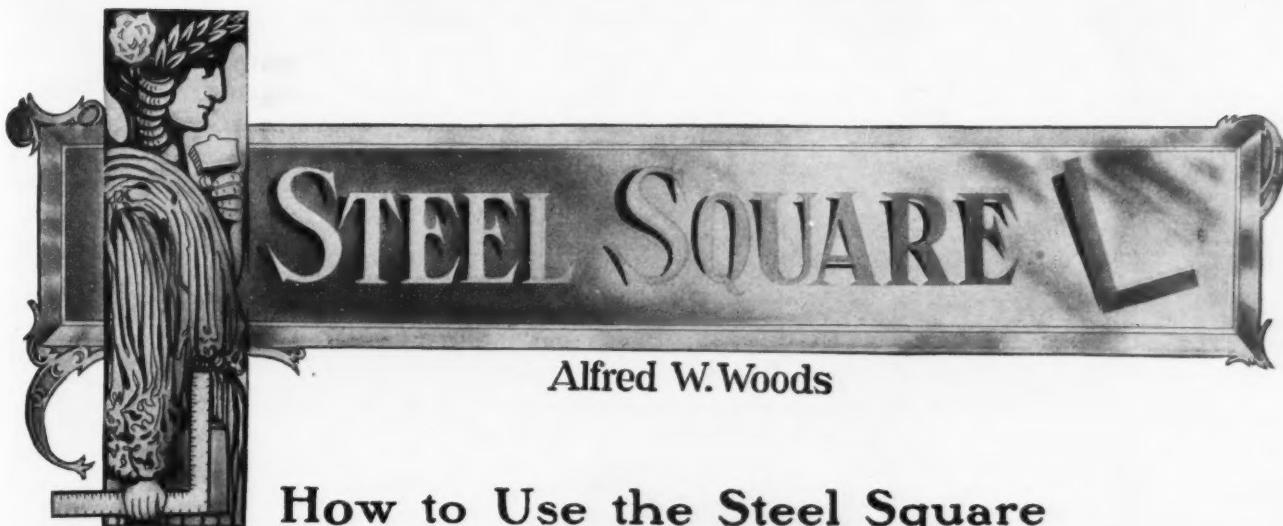


Baltimore's Sewer System

Baltimore's proposed sanitary sewerage system is attracting world-wide attention, Sewerage Engineer Hendrick being in constant receipt of letters of inquiry from engineers in all parts of the world. These requests are decidedly encouraging and speak well for the unique system that promises such excellent results. Mr. Hendrick, thanks to the stir that the new system has caused, is in great request. He is in receipt of many invitations to speak in various places on the new system, committees from many associations calling on him to extend invitations. These he has been compelled to refuse, as he is one of the busiest engineers in all the world. One of the compensations of a great fire is found in the circumstance that sweeping changes can be made in the rebuilding.



Things may come to the man that waits, but the fellow that keeps making things happen is a good one to copy after. He doesn't wait for things to come to him, but goes after them.



How to Use the Steel Square

SHOWING A GENERAL RULE FOR DEVELOPING THE CUTS AND BEVELS FOR POLYGONAL SHAPED BUILDINGS BY THE AID OF TRIANGLES AND THE RELATION OF THE STEEL SQUARE TO SAME

ILLUSTRATING the cuts and bevels with the triangle is probably the most practical way of showing the various cuts contained in and about the roof, regardless of its shape or pitch given the rafters, as by its manipulation all of the angles

the case of the square cornered building, because the tangent and the run are of equal lengths. As this does not occur in any other than the square corner, it is therefore not a general rule. We regret the slip, but then we take consolation in the fact that the best of jugglers sometimes make a mismatch. However, it serves as a good illustration to show wherein the difference lies.

In Fig. 90 is shown the triangles for a hexagon (six sided) roof and by comparing with the preceding illustrations, the reader can see wherein they differ. The application is the same except in the sixth angle. Angle No. 1 represents the plan and governs the layout of the diagram. In this, the angle between the runs of the common rafter and

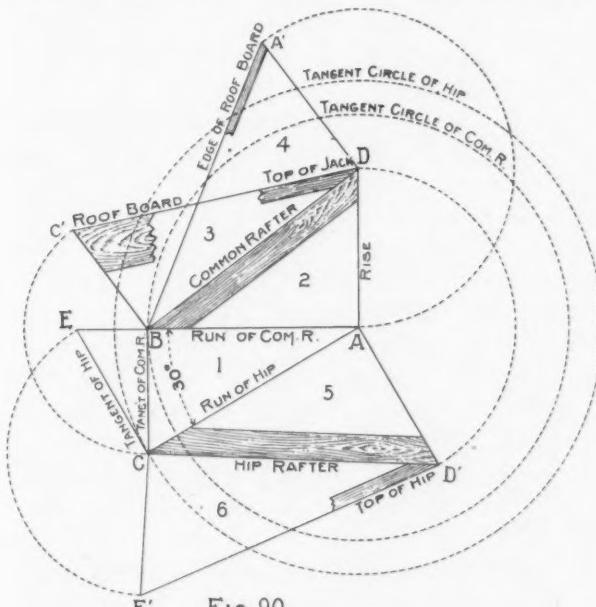


FIG. 90.

can be obtained. The steel square serves as the triangle, the blade and tongue forming two of the sides (run and rise) and these, applied to the pitch given the rafter, forms the third side, or if it be for a miter, then the angle in degrees of same from the starting point from the surface cut will give the proper angle to obtain the cut. In the last two illustrations are shown the various triangles in developing the lengths and cuts of the rafters for a square cornered building, but in an unguarded moment we said, "proceed the same as above" for polygonal roofs. This would have been all right if we had used the tangent instead of the run of the hip to obtain the side cut. The result is right in

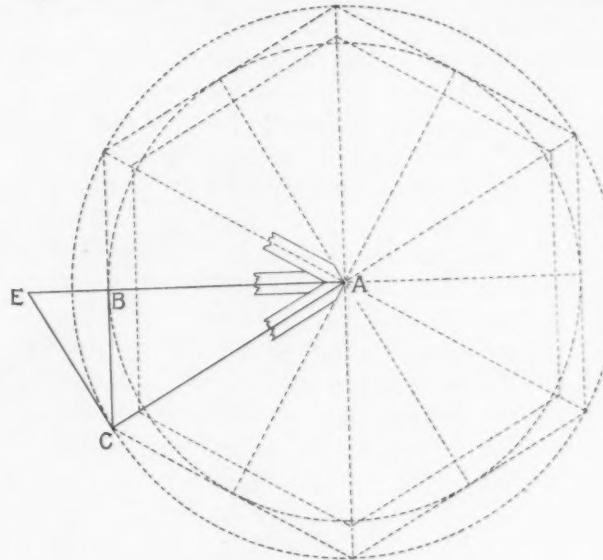


FIG. 91.

the hip are at 30 degrees. Now, by referring to Fig. 91, we show the angle bounded by A-B-C as shown at No. 1 applied to the plan of the roof as follows:

A-B run of the common rafter. A-C run of the

hip. B-C tangent of the common rafter. Now by extending A-B intersecting a line at right angles from A-C as at E, then E-C will represent the length of the tangent for the hip. Note:—See the

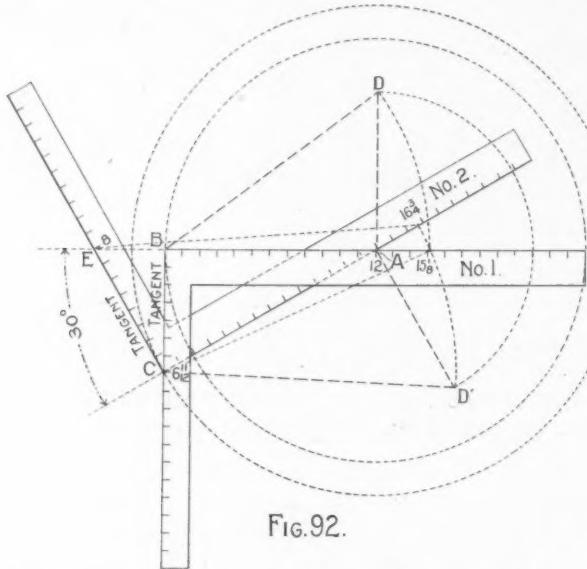


FIG. 92.

difference in length when compared with the run of the hip.

In Fig. 92 is shown how these angles may be obtained with the aid of two steel squares. It may be worked to a scale of one inch to the foot, or full scale for a one-foot run of the common rafter, as shown in the illustration. The figure on the tongue that gives the hexagon miter ($6\frac{1}{11}-12$) represents the tangent for the common rafter as shown on square No. 1, and by placing square No. 2 with its heel resting at $6\frac{1}{11}-12$ and with the blade intersecting at 12 on square No. 1, then a line continued from the heel of square No. 1 and in line with the blade intersecting the tongue of square No. 2, which in this case is at 8 and represents the tangent for the hip. Now by erecting the rise from the intersection of the blades to D and D'. Then B-D represents the length of the common rafter and D'-C that of the hip and these lengths, taken on the blade of the respective squares, will give the figures to use for the side cuts of the rafters. Thus— $6\frac{1}{11}-12$ and $15\frac{1}{8}$ as shown, will give the side cut of the jack, or of the common rafter, to fit in the angle between the hips at the peak (See Fig. 91) and 8 and $16\frac{3}{4}$ will give the side cut of the unbacked hip to fit in the peak,

or if it is first backed, then the same figures as shown on square No. 1 applied to the backing plane will give the same result. But of course, this is not practical, because the ends of the hip would run to a feather edge, as shown. A better way is to insert a hexagon block with sides equal, the width of the hip, then the cut on the hip would simply be the plumb cut. This would afford a better nailing space and each hip would have a direct bearing against the one on the opposite side.

In Figs. 83 and 84 are illustrated the side cuts of polygonal jacks and to complete this line of work, we show in Fig. 93 the accompanying illustration of the seat and plumb cuts for the corresponding hips and valleys. Beginning at horizontal line, which represents the run of the rafters, then 12 and 9 on the steel square represents the cuts for the common rafter for the 3-8 pitch. The steel square just beneath the horizontal line and with the 12-inch mark on the tongue resting at the rise, locates the angle of the respective runs with that of the common rafter and the figures to use on the blade of the square are the same as those used for the polygonal miters and as shown in the table. It will be seen, the vertical line dropping from 12 on the tongue of the steel square at the seat cut of the common rafter,

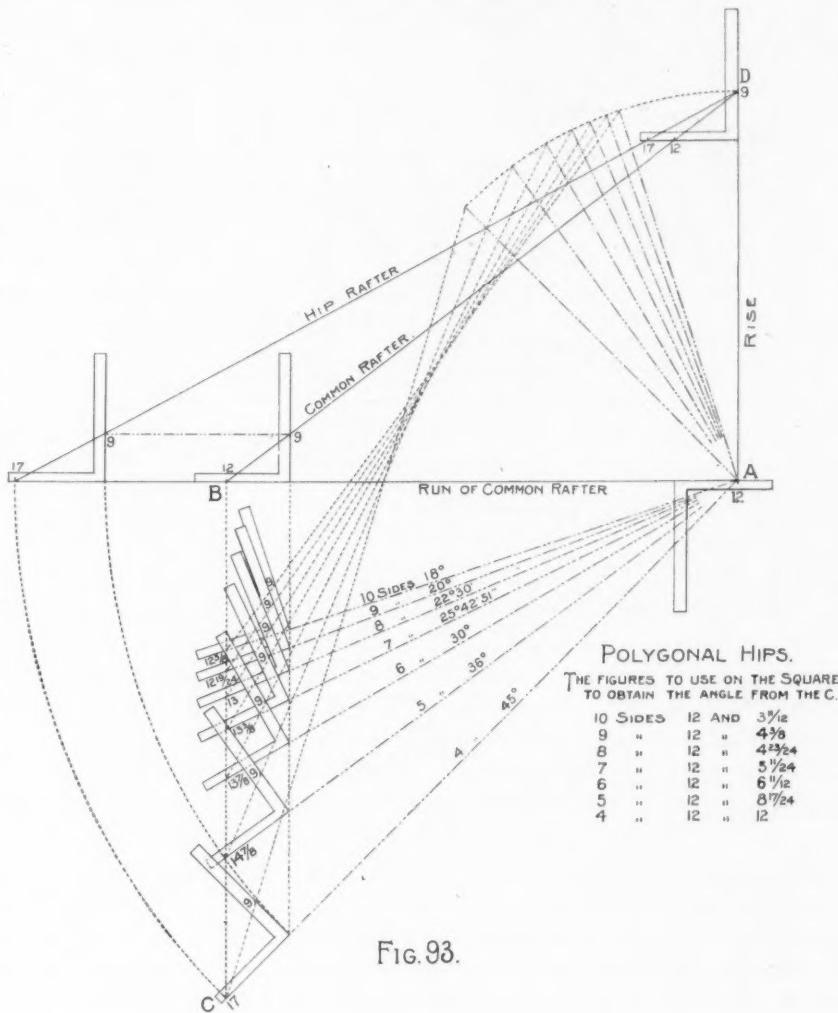


FIG. 93.

as at B, and where the same intersects the figures on the tongue of the squares resting just beneath on the individual runs, gives the figures to use on that member for the cuts. The rise being the same as the common rafter, we use the same figures on the blade, as will be seen by referring to the illustration. Now if the runs of the hip were pivoted at the point of the rise, as at A, and we could raise them up until they rest on the horizontal line, it

would be found that the pitch lines would center at one point at the top, as at D, and they would all fall in between 12 and 17 on the tongue and center at 9 on the blade. The figures on the tongues of the squares would remain as shown for the seat cut. If there was no pitch given to these rafters, then the corresponding figures that gives the polygonal miters will give the side cut of the hip, though the cuts on the square would be reversed.

Scrolling with a Band Saw

SAW MUST BE SHARP TO DO GOOD WORK — BETTER RESULTS OBTAINED AND TIME AND MONEY SAVED BY USING AN AUTOMATIC SAW FILER

By J. Crow Taylor

THREE is really too much tendency to do scroll work with the band saw these days which by rights should be done on the scroll saw. This subject has been mentioned in these columns before, but the general persistence in the practice suggests the necessity of not only making mention of it again, but of adding a word or two of advice, and that is, if you will substitute the band saw for the scroll saw try to make it do its work better than the average band saw usually does it. This is no reflection on the average band saw, because they do the work well as band saws, but to compare the average band saw work to scroll saw work is quite frequently like comparing rough sawed lumber to stock that has been through a planer. Some well kept band saws in the hands of an expert will do nicer work than some poorly kept scroll saws in the hands of an ignorant or slothful operator, but that doesn't alter the fact that with the same degree of skill and care in the operation of the machines the scroll saw will do much smoother work than the average band saw and quite frequently this difference amounts to more in the cost of sanding and smoothing up by hand than the extra time to do the work on the scroll saw as compared to the band saw. Therefore, if you persist in using a band saw for scroll work, see to it that it is kept in the pink of condition, so as to reduce to the smallest possible minimum the hand sanding required to make a smooth job.

Do you know, I think the best thing that one can turn to, as an aid to keeping the band saw in the pink of condition, is an automatic filer or sharpener. I am not out to advocate the use of any special machine, that would not be fair, and besides it has been a number of years since I have used one of these band saw filing machines, and many new and improved ones have come on the market since, but with one of the old reciprocating type used ten years ago, one of the kind which has been discarded frequently as being unsatisfactory, I got results that were so pleasing that I would not operate a band saw again without an automatic machine to do the filing. In the first place, it's too big and too tedious a job to be continuously filing a fine tooth band saw, such as is necessary for smooth work,

by hand, and in the next place, the time required costs so much money that it is decidedly cheaper to buy an automatic machine. With these machines, as with everything else, a man has to study them and learn how to use them for the best results, otherwise they will not give the satisfaction they should. The main fault I have found in their use, has been the tendency on the part of those using them to make the filing machine cut too fast. They want to get done too quickly, and make the machine sharpen a tooth at each stroke. The way to get excellent work out of such a machine and also out of the saw, because it means keen points, is to set this automatic filing machine so it cuts very lightly and let it go around the saw two or three times, depending on the amount of work necessary to put keen points on the teeth. I had rather go around a dozen times with a machine as to undertake to put it in good shape with one trip around it. After the machine is carefully adjusted it practically takes care of itself. Of course, you can not go off and leave it alone by the hour, but you can be doing other things and keep an eye on the sharpening machine meantime, so there is very little additional cost in the extra time required to file a saw with a machine cutting lightly. The great thing with such a machine is that it encourages keeping the machine sharp and in good order, and if in addition to using them one will give careful attention to the setting the average band saw, work can be decidedly improved in point of smoothness. And that's what we need when we do scroll work with a band saw, smooth cutting, and the only way to get smooth cutting is to have a band saw in the pink of condition.



Not His

"Tommy," said the teacher, reproachfully, "why didn't you take your hat off to me when you passed me yesterday?"

"I didn't have me hat on, ma'am," replied the boy.

"Don't tell me that. I saw you."

"I know you seen me, but you didn't see me hat. Dat wuz me brudder's hat I had on."



Construction of Casement Windows

METHOD OF CONSTRUCTING WALL ON BOTH INSIDE AND OUTSIDE—HOW TO MAKE THEM PROOF AGAINST WIND AND RAIN

COMMENCING with this number we will consider for awhile the construction of the casement window opening outward. We illustrate first a double casement in a frame wall, with the sashes hinged at the side and opening outward, and with a stationary transom overhead.

The wall is constructed of 2 by 4-inch studs, placed 16 inches on centers and doubled for jambs, heads and sills of openings. It is covered on the outside with matched sheathing boards, heavy tarred felt and random width shingles. The inside is wood lathed and plastered three coats.

The frame is molded and rebated as shown, and one and three-quarter inches thick. The sashes require heavier stiles and rails than the sashes for double hung windows do and in cases where it is desired that as little wood as possible shows, the sashes are made of cherry or other suitable hardwood and are reduced in size. The stiles and bottom rail of sashes, in addition to being rebated, have grooves cut in same as shown, so that any water which may beat its way in will run out through the grooves.

The sashes are shown glazed with double thick glass, bedded in putty, sprigged, and back-puttied. For large sashes or where plate glass is used wood beads or moldings are better than the putty for securing the glass in place.

The sill is rebated for the lower rail of sash and is ploughed for stool and shingles. All spaces about the frames are calked with oakum and pointed with "scratch" mortar.

The trim or architrave is molded and formed out of seven-eighths inch stuff, is blocked on the back and is provided with a back band and a neat wall mold. This wall mold being small may be bent to fit the slight unevenness of the plaster. The inside stop bead should be of the same material as the trim and similarly finished. In the better class of buildings the stop bead is secured in place by means of round head brass or bronze screws set in a sunken socket of brass or bronze, instead of being nailed in place. By this means the stop bead is easily removed without marring the wood or varnish or may be slightly shifted in or out, if the sash binds or rattles, by merely loosening the screw a little. Stop beads should never be less than one and

three-quarter inches wide so that window shades may be set on same.

Fig. 144 is a section taken through the head of the window. The top of the outside casing is covered with tin turned down over the outer edge and neatly tacked, and extending up under the shingles or other exterior covering about six inches. A little wood fillet is placed over the cap as shown to give the first course of shingles the required tilt.

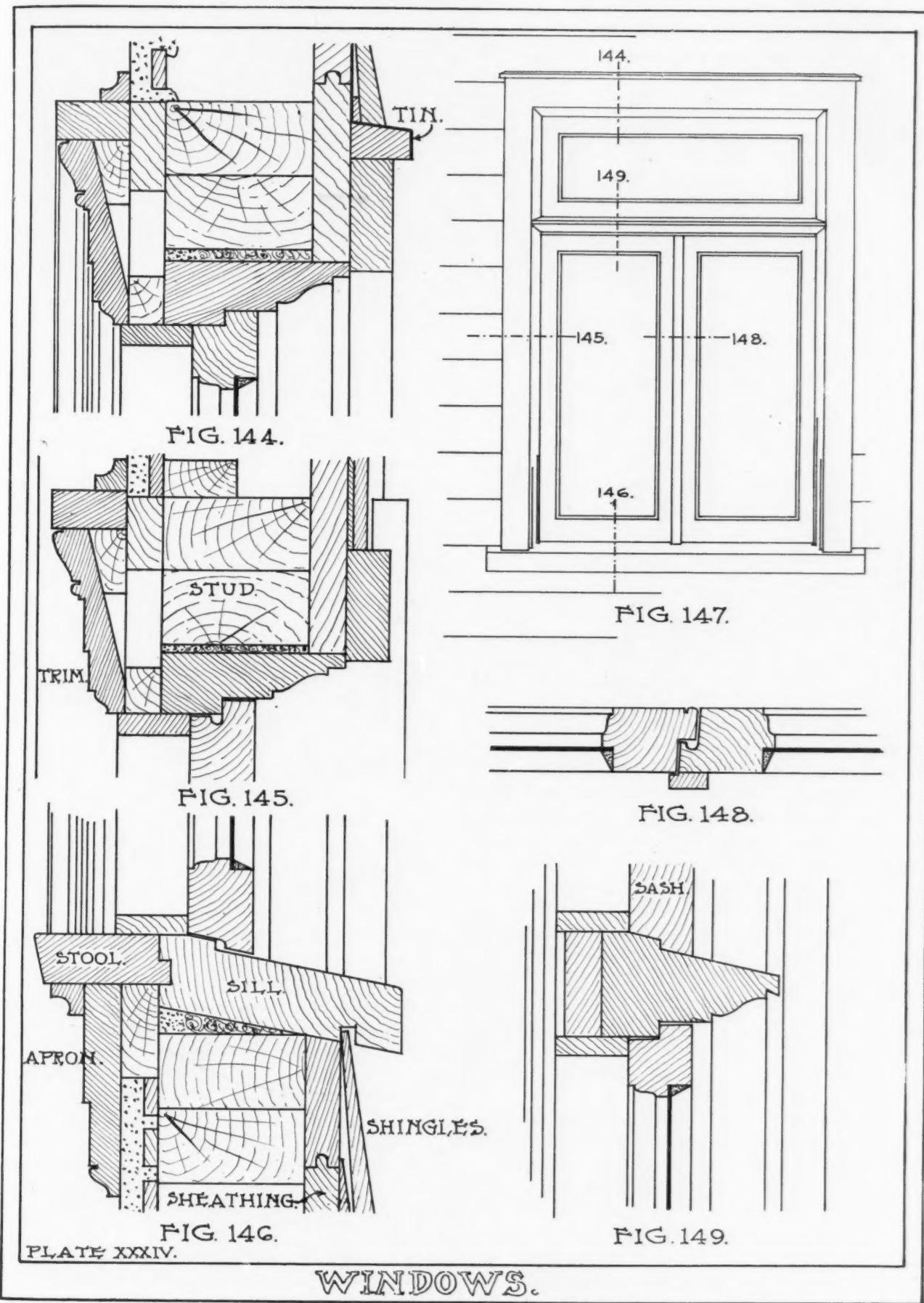
Fig. 145 is a section taken through the jamb of the window. The block or furring strip which is shown nailed on to the side of the stud, is necessary as a nailing for the lath which cannot obtain a direct bearing and nailing on the stud, owing to the position of the ground to which the inside architrave is nailed.

Fig. 146 is a section taken through the sill of the window. As an additional precaution against rain beating in under the lower rail of sash a molded water nose might be let into the rail on the outside or a groove might be cut on the underside of the rail near its outer edge.

Fig. 147 is an exterior elevation of the window and the dotted lines with the numbers indicate the cuts from which the sections illustrated are taken.

Fig. 148 is a horizontal section taken through the meeting stiles of the sash. The standing leaf is rebated and the inner edge is beaded. The other leaf is rebated and grooved and has a flat band or astragal planted on the outside to cover the joint of the meeting stiles. The groove in the stile catches any rain-water which may beat in, and carries it down to the sill. Note that there is a slight bevel to the joint of the meeting stiles to allow for the play of the sashes.

Fig. 149 is a section taken through the transom bar. The upper or transom sash is stationary and is rebated over the transom bar and the joint is made in whitelead. When the transom sash is hinged or pivoted a water nose or groove is usually provided on the lower rail of sash. The transom bar should have about the same pitch as the window sill so as to properly cast off the water and the outer edge should have an undercut as shown to prevent dripping water from running down under head of frame and in over top of sash. The inside surface of the transom bar is paneled as shown and inside stop bead follows across same.



Geometrical Handrailing

PLAN OF A CIRCULAR STAIRWAY SHOWING THE WINDERS AND RISERS—COMPLETE DRAWINGS SHOWING THE VARIOUS DETAILS OF CONSTRUCTION

By Morris Williams

IN FIG. 1 is shown the plan of 20 winders and tangents to a circular plan stairway containing 21 risers.

As the number of pieces in the wreath is a matter of judgment we will in this example determine upon 5 pieces—the first from the newel to riser 4; the sec-

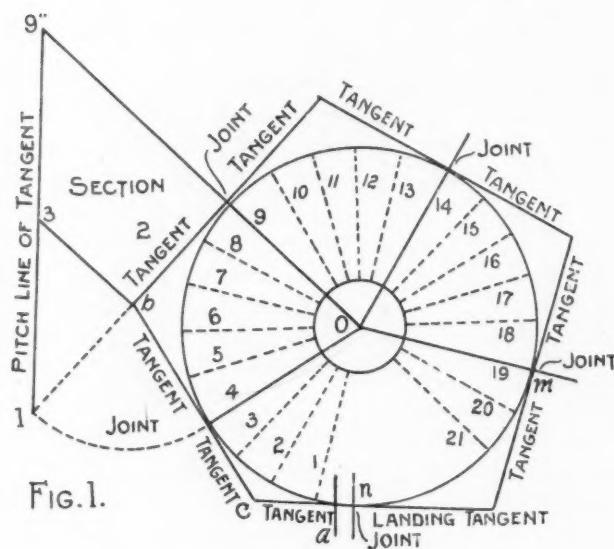


FIG. 1.

ond from 4 to riser 9; the third from 9 to riser 14; the fourth from 14 to riser 19, and the fifth from 19 to the junction with the second story landing rail.

An inspection of the plan tangents will show that the plan tangents of each piece of wreath form an obtuse angle with one another. Therefore all that is required to find the tangents as the face mold call for is to find the form of a section cut through a prism having an obtuse angle base.

The developed tangents of the face mold will be the outlines of two sides of the developed section of the prism.

To make this principle clear we will take the second portion of the wreath for an example.

As shown in the plan, it reaches from 4 to 9; the plan tangents being 4-b and b-9, respectively; and the springing lines 4-o and 9-o respectively.

These lines, therefore, will form the base of the obtuse angle prism. Continue the tangent 9-b to I and revolve point 4 as shown to I.

Upon 9 is erected a perpendicular line 9-9"; equal in length to the height the portion of the wreath will rise from 4 to 9, which is shown to be equal the total height of the 5 risers marked 5-6-7-8-9 in the plan. By connecting 9"-I we obtain the pitch line of tangents and by erecting a perpendicular line from b to the pitch line of tangents in 3 we find that the two tangents

are equal in length and inclination as shown from 9" to 3 and from 3 to I.

We refer now to Fig. 2 where the development of the section is accomplished with but very few lines in addition to those already explained.

It will be observed that in this figure we have the same base, viz., o-4-b-9-o as in Fig. 1; also that the pitch line of tangents 1-3-9" is the same as in Fig. 1. To find the form of the section draw the line 4-m in the plan; and the line m-2-a" square to the pitch line of the tangents. Place one leg of the compasses in 3, extend the other to 1 and turn over as shown to a"; connect a"-3; connect also a"-1. From 3 draw 3-o" parallel to a"-1, and make it equal in length to o-b in plan; now connect o"-9" and o"-a"; thus completing the form of the section, viz., o"-9"-3-a". The angle formed between the two lines a"-3 and 3-9" will be the angle required between the tangents of the face mold. In this diagram is also shown the center line of the wreath. The distance 3-7 is made equal to b-7 in the plan; and the curve is described by bending a lath to touch 9"-7-a".

In Fig. 3 a view of Fig. 2 is given in perspective—

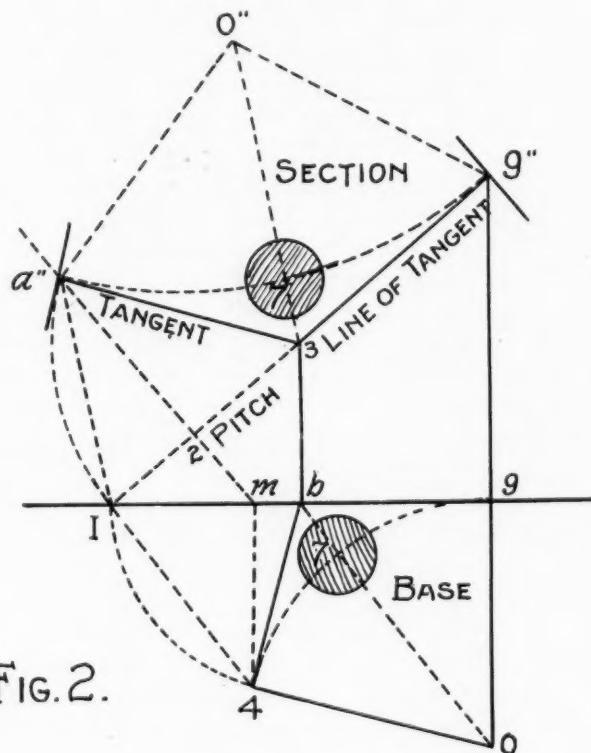


FIG. 2.

every line and point being shown in their correct position and relation to one another. In this figure is also shown the bevel required to square the wreath and is shown to be composed of the lines 4-m, m-2

and 2-4. By referring to Fig. 2 we find the line 4-m to be perpendicular to line 1-b-9 drawn from 4, and the line m-2 to be perpendicular line to the pitch line of tangents drawn from m.

In Fig. 4 these lines are formed into a right angle triangle having 4-m for base, m-2 for altitude, and 2-4 for hypotenuse; the angle at 2 forming the bevel.

It will be well to remember that the method as here shown to find the bevel is applicable in all cases where the tangents, as in this case, are equally inclined; and furthermore, that one bevel only will be required in such cases, which will have to be applied to both ends of the wreath.

We will refer now to Fig. 5, which represents the

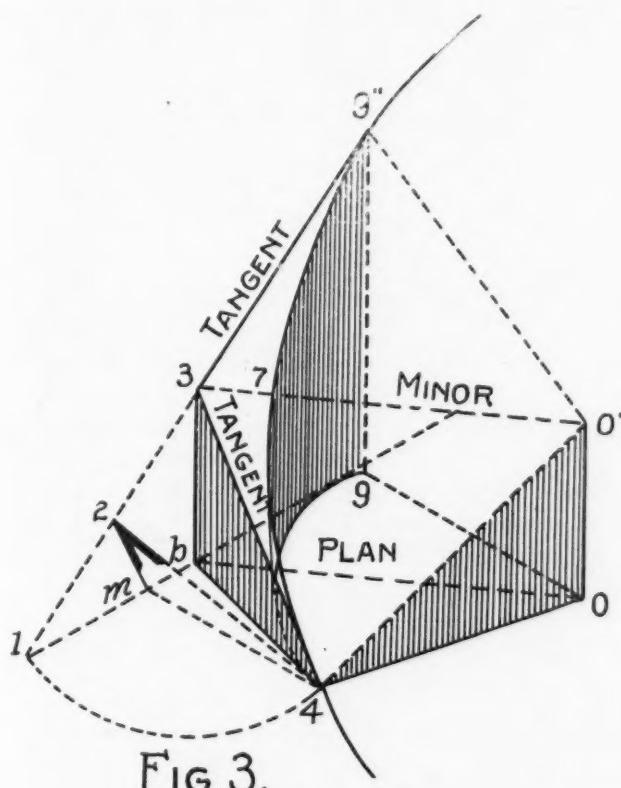


FIG. 3.

face mold, and in consideration of the explanations given in the other figures it will be observed that to find the form of the face mold, as in this figure demonstrated, becomes a very small item in the construction of a wreath.

Let the line a-b represent the edge of an inch board intended for the mold. Gauge a line at a distance from the edge equal to one-half the width of the mold, and on this line place the distances 1-2-3-9" as shown on the pitch line of tangents in Fig. 2. On 2 in Fig. 5 erect a perpendicular line independently; place one leg of the compasses in 3, extend the other to 1, turn over to cut the line from 2 in a" and connect a"-3, which is one of the tangents; the other being 3-9", and the angle formed between the two as here shown will be the angle required to square the joints of the wreath at each end.

Now make 3-7 equal 3-7, Fig. 2; take 7 for a center

of a circle having a diameter equal to the width of the straight rail.

Here, also, is a pointer that should always be kept in mind, viz., that the width of the mold in all cases

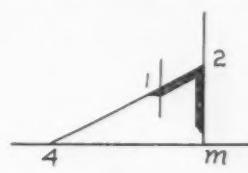
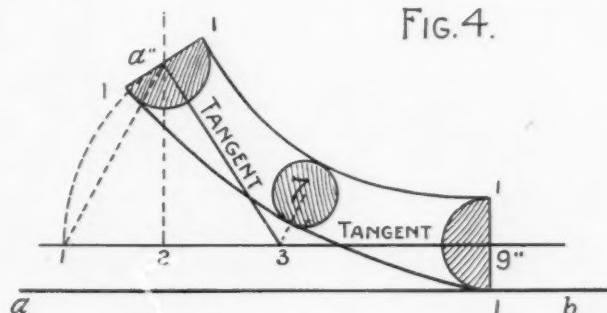


FIG. 4.



circles as shown in the figure. Now draw the curves to touch the circumference of each semi, and also that of the circle on both inside and outside of the mold; then draw the joints square to the tangents, thus completing the face mold.

Referring now to the plan Fig. 1 it will be observed

that this mold is for a wreath extending from riser 4 to riser 9, and

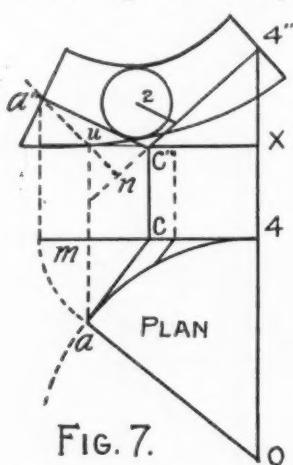


FIG. 7.

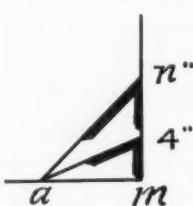


FIG. 8.

that the same mold will suffice to cover the distance from riser 9 to riser 14, and again from riser 14 to riser 19, the three sections being equal in plan and inclination of tangents.

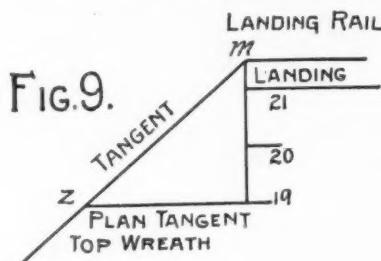
We will further require to draw the face mold and find the bevels for the section that starts from the newel and extends to riser 4, and also the section from riser 19 to the second story landing rail.

Both these sections will have one tangent level—the bottom one to form an easement at the junction of the rail with the newel and the top section to align with the level rail of the landing.

Another requisition of these two sections will be that the inclined tangent in each will have to be of the same inclination as all the other inclined tangents so as to secure a graceful appearance to the finished

rail and equal length of balusters.

In Fig. 6 is shown how to find the length of the plan tangents of the bottom piece of wreath which are shown in Fig. 1 at a-c and c-4, and which will meet the conditions as above stated.



Draw the pitch line of tangents as shown in Fig. 6 from 9" through 1 and beyond a; draw the perpendicular line 9"-1 and make it equal in height to 9 risers; through the fourth riser draw the line 4-1. It will be observed that the line 1-9" is the same line as shown in Figs. 1 and 2 and represents the pitch of the inclined tangents.

From riser 2, Fig. 6, draw the line 2-c-a, and from 1 drop the line 1-c.

By this process we have found the length of the plan tangents 4-c and c-a, which are shown in Fig. 1, and in this figure at c-a.

The pitch line of tangent 4-c will be the line a-1, and as shown it has the same pitch as that of the inclined tangents shown from 1 to 9 and therefore will meet the condition stated above, viz., a uniform pitch of tangent. The plan tangent c-a, as before stated, will be a level tangent, so that an easement may be formed in the wreath to butt against the newel, and as shown in Fig. 6, it is raised from the floor the height of two risers. If it is desired to raise the rail higher, say the height of 2½ risers from the floor, it may be accomplished by drawing one line d-m-n. In this case one line m-n gives the length of the plan tangent, and the line n-1 the pitch of the inclined tangent, which, as shown and as required, is uniform with all the other inclined tangents.

We will now draw the face mold for this wreath and

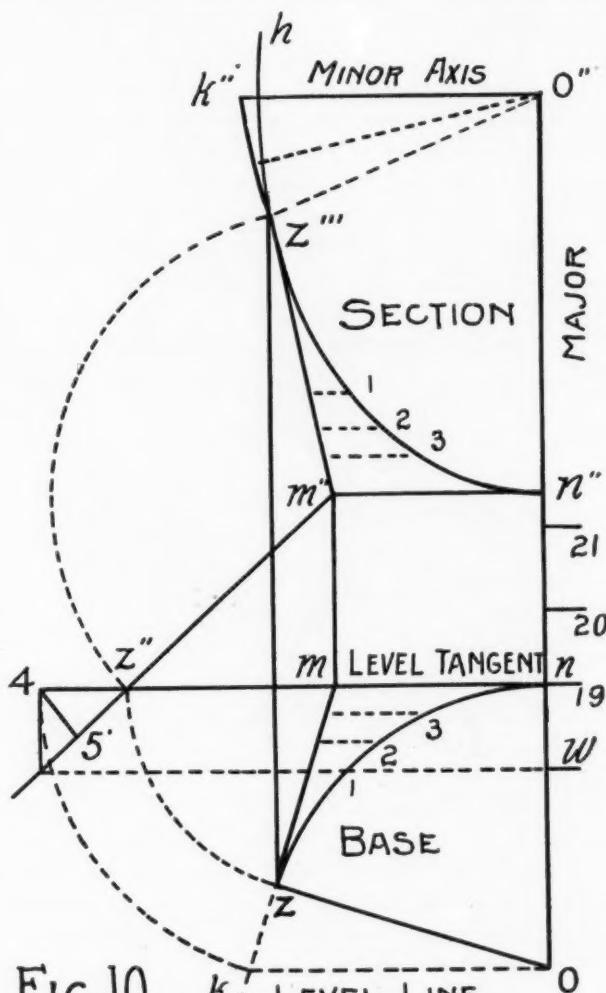


FIG. 10. k', LEVEL LINE

decide for the rail to butt against the newel at the height of 2½ risers from the floor line, then the plan tangents will be those shown at m-n in Fig. 6.

Referring to Fig. 7, let o-a-c-4 be the plan taken from Fig. 1.

On 4 erect 4-4" equal in height to 4 risers; draw one line y-x the height of 2½ risers from 4; draw the pitch line 4"-c". It will be observed that the triangle c-x-4" in this figure coincides with the triangle n-m-1 in Fig. 6.

From a draw the dotted line a-u, and through u square to the pitch line c-4"; draw the dotted line n-a"; place one leg of the compasses in c", extend the other to y, and turn over to a"; connect a"-c.

This line will be the level tangent a"-c" of the plan, transferred to the face mold, and c"-4" will be the inclined tangent as required in the face mold. The angle formed in the junction of the lines will be the angle between the two tangents called for on the face mold for the purpose of squaring the joints.

The joints may now be drawn at the end a" square

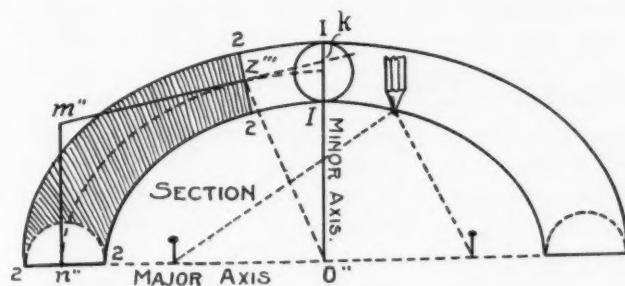


FIG. 11.

to the level tangent a"-c" and at the end 4" square to the inclined tangent c"-4".

The bevels to square the wreath are shown in Fig. 8, and are formed as follows: Make m-a equal m-a and m-4 equal u-n, and m-u equal x-4" in Fig. 7; connect 4"-a, and n-a. The bevel at n is to be applied to the end a" of the wreath and that at 4 to the end 4". The curves of the mold are drawn by finding a level line in the plan and a corresponding level line in the section. That in the plan runs parallel with the level tangent a-c; and the corresponding one in the section parallel to the level tangent c"-a" of the mold. The width at each end is taken from the bevels as explained

in previous examples, and the curves drawn by bending a flexible lath to touch the points thus found.

In Fig. 9 is shown how to find the length of the plan tangents shown in Fig. 1 at m-z-n.

The tangent m-z will have the same pitch as that of

all the other inclined tangents; and the tangent z-n will be level to align with the level landing rail. It is shown in the plan Fig. 1 that the bottom end of this wreath connects with the piece next to it, over and above riser 19, and that it has to rise over risers 20 and 21. In Fig. 9 is shown the elevation of these risers where riser 21 indicates the location of the floor line.

Above the floor line is shown the center line of the level landing rail raised one-half a riser above the floor line. We have now the data to determine the length of the plan tangents.

From m drop a line to 19.

The length of this line as shown equals the height of 2 risers and $\frac{1}{2}$ a riser. Again from m draw a line to represent the pitch line of tangents to z; connect z-19, which will be the length of the plan tangents shown in Fig. 1 at m-z-n.

We will now take these lengths to form the base of a prism as shown at z-m-n in Fig. 10 (the radius of center line of rail being z-o or o-n), and proceed to develop a section cut through its sides.

We know that the side m-n is to be level, and that it is to be raised the height of $2\frac{1}{2}$ risers above the base line; therefore, upon m and n erect the lines m-m" and n-n" the height of $2\frac{1}{2}$ risers.

Connect m"-n". This line represents the elevation of the level plan tangent m-n, and also indicates the height of the level landing rail.

Place one leg of the compasses in m; extend the other to z; turn over to z", and connect z"-m"; which will represent the pitch line over the plan tangent m-n. From z in the plan draw the line z-h; place one leg of the compasses in m"; extend the other to z"; turn over to cut the line z-h in z"" and connect z""-m". By this process we have revolved the inclined tangent m"-z" to its position as required in the face mold; the line m"-n" being the level tangent as required in the face mold; and the angle between the two as here shown will be that required on the face mold to square the joints.

Now make z""-k" equal to z-k in the plan, and from k" draw the line k"-o" parallel to the level tangent, m"-n".

The line k"-o" will be the minor axis and its plan is the line k-o, shown in plan. The major axis will be o"-n". By connecting o"-z"" the form of the section will be complete; its outlines being n"-m", m"-z", z""-o", and o"-n".

It is shown in the figure how to develop the center line of rail by means of few ordinates, or level lines. Those in the plan are drawn parallel to the plan level tangent m-n, and those in the section parallel to the level tangent of the section m"-n". The lines in the section are made equal in length to their correlative lines in the plan and the curve is traced as shown from n" to z", touching the points of the level lines at 1-2-3.

The face mold for this piece of wreath is shown in Fig. 11.

Draw the straight line marked major axis and square to it draw the lines n"-m" and o"-k"; make each one equal in length to those lines in the section Fig. 10 bearing the same descriptive letters, and connect m"-k.

On this line fix point z"" at a distance from m" equal m"-z" shown in the section Fig. 10, connect z""-o".

From o" along the minor axis measure a distance equal to the radius of the plan rail o-z, Fig. 10, and on this point describe the small circle shown, having a diameter equal the width of the plan rail. On each side of z"" measure a distance equal to 4-2, shown in Fig. 12, and on each side of n" a distance equal to m-2 in

the same figure. To find the points where the pins are to be fixed on the major axis, and are known as the foci of the ellipsis, take the length of the semi-major $o''-z$ in the compasses and point z on the minor as center, and extend to cut the major in where the pins are shown.

To these pins fix a string as shown; extend it to z on minor; place pencil as shown, and sweep the curve.

The same process is to be used for the outside curve.

In the figure we show a full semi-ellipse with the object of showing that the curves of a face mold for a wreath in all cases (where the plan curves are portions of circles) are portions of eclipses.

The face mold in this case is the shaded portion shown extending from n'' to z'' , the tangents being $n''-m'$ and $m''-z''$.

The joints are to be made square to these tangents, as shown at n'' and z'' .

Two bevels will be required to square this wreath, which are shown in Fig. 12, and are found as follows: Make $z-o$ equal the radius of the plan center line of rail shown at $o-z$ and $o-n$ in Fig. 10.

Make $o-4$ equal $4-5$ and $o-m$ equal $w-n''$ in the same figure. Connect $4-z$ and $m-z$. The bevel shown at 4 belongs to the end z'' of the wreath, and that shown at m to the end n'' .

Future of Cement Brick

WHY THEY ARE BECOMING MORE POPULAR AS A BUILDING MATERIAL—THEIR POSSIBILITIES—ADVANTAGES
OVER CLAY BRICK

By George J. Seymour

MANY prominent cement block men are inclined to think, and honestly so, that the demand for cement brick will not last and that it will never gain any degree of prominence in the building world, giving as their reason that the cement brick does not save a builder as much as the cement block does, nor, they claim, enough to make it an object to use instead of clay or pressed brick.

Of course there is no standard price for cement brick, and dollars and cents alone considered, one cannot tell exactly how much is saved by using cement brick. Some claim that quality and everything considered, from twenty-five to thirty per cent is saved, but that would depend a good deal on the locality.

The price of cement brick varies a good deal. You cannot blame a man for getting the highest price possible for his product. In some cases cement brick have sold for almost twice the price of clay brick and as high as many high grade pressed bricks. This being the case in these early stages of the cement brick business, when it has not established for itself a public confidence nor gained any great degree of favor with architects and builders, it does not look as if their statements were true. They overlook several important points which I shall try to enumerate.

There has been a gradual evolution in the clay brick business which has demanded certain changes, and paved the way and created the field for cement brick.

Fuel has taken big jumps in price in the last few years and is on the increase. There is no prospect of a reduction in the price of it.

The price of labor especially skilled labor, has advanced considerably lately. To run a clay brick yard requires a large number of men, many of whom must be skilled. The work is of a very laborious character, and many are loth to engage in it which naturally increases the difficulty of getting labor, and raises the price of it.

It is no easy matter to obtain suitable clay in a suit-

able location. Even when this is obtained there is always an immense loss in burning, in handling, and on account of the Spring and Autumn frosts. All of which in the last few years has tended to increase the price of clay brick forty per cent, making it prohibitive for men of ordinary means to build, while the profits of the manufacturers have not increased by any means at a proportionate rate.

To make cement brick absolutely no fuel is needed, eliminating at once a very large item in the cost of manufacture. If the machine is a power machine it can be run by a gas engine or by an electric motor, which will also run the mixer, or if it is a hand tamped machine, a small motor or gasoline engine costing but very little, will run the mixer.

Four or five men are all that are needed to run the average cement brick plant. I know of plants having a capacity of over 20,000 cement brick a day, that are run with five men and a boy. The work is not laborious nor is the labor skilled, so that it is neither high priced nor hard to get.

Cement brick are very much harder than clay brick. There is no loss in manufacture and little or no loss in handling. This is a more important point than many may be inclined to imagine. During the building of the foundation of a large hotel, I recently watched a man sending clay brick down a chute from the street to where the work was being done. The man was particularly careful to handle them gently and yet when they struck the bottom, at the very least, one out of every twenty, broke. I do not say that every broken brick was rendered useless but a great many were. This would not happen with cement brick. I would wager you could send a whole load down the chute, and find only one or two even broken.

I have mentioned a number of things that make the cost of manufacturing cement brick much less than that of clay. This should certainly allow some saving by using cement brick.

Of course the price of cement is somewhat high, and together with the sand depends on the locality for its price.

Using a six to one mixture, it takes one and three-quarter yards of sand to make a thousand brick, and for the very best outside brick two barrels of Portland cement. By using a somewhat coarse sand, one and a half barrels of cement, makes a very strong and excellent brick for inside the solid walls. Therefore the only things that determine the cost of the brick are the price of sand and cement in the locality, the wages of five unskilled men, and the cost of piling the brick. Certainly this compared with the cost of making clay brick should convince anyone that the manufacturing cost of cement brick is lower than that of clay, and if the manufacturing cost is lower the selling cost can be made lower.

But a very essential point forgotten, is that they are a better brick. They are more waterproof and will last an endless time only improving with age instead of deteriorating which is the case with clay.

Then as compared with cement blocks they are smaller in size and not so liable to be poorly made. Poorly made cement blocks are common and this fact has retarded their progress. Though many imagine that most of the cement brick is poorly made, facts have not shown this. The cement brick has very, very few, if any, failures charged up against it, mainly because it is very much easier to make a good cement brick than a block.

Then there is not so much prejudice against them on the part of the masons as there is against the blocks which makes progress easier.

Business success to-day depends on different things than it formerly did. While merit is still recognized as an essential feature it does not play the important part that it did. The manner in which a business is conducted, the way it is pushed, the forceful and energetic plans of the man who is running it, almost wholly determine its success. You have probably seen very worthy and meritorious ideas fall flat simply because they were not handled by the right kind of a man, while many times rather indifferent ideas have met with phenomenal success, on account of the push of the man or the men in charge. So the success of the cement brick industry will depend very largely, and I am inclined to think more than anything else, on the kind of men who engage in it and the amount of push that they put in it.

During many building booms there is immense difficulty in getting clay brick when winter approaches, because the plants have to close down, which means leaving a building half finished, an immense loss of time and money.

The weather does not handicap a cement brick manufacturer. He can run his plant twice as long a season as a clay yard can be run and he can have brick on the market two months earlier than the clay brick manufacturer, with the same advantage in the Autumn, while some keep their plants running all year round.

Just as surely as Portland cement has supplanted pine planks for sidewalks, and as surely as it has displaced all other materials in public works, in foundations, and in heavy structures, will cement brick become an established building material and in time supersede the clay brick.

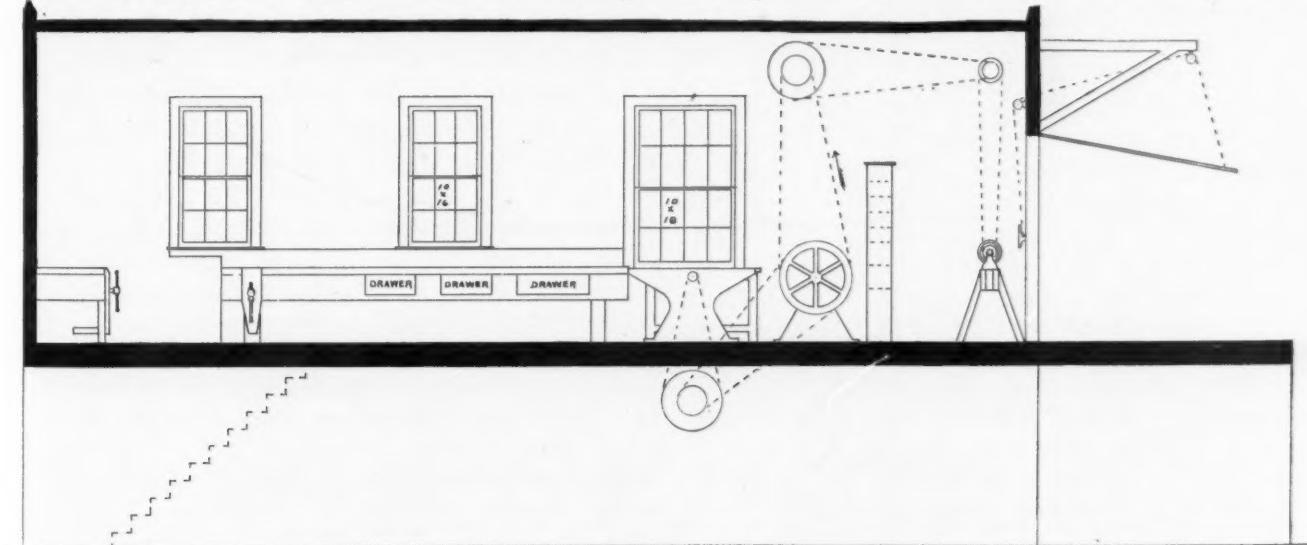
Machine Carpenter Shop

PLAN AND ELEVATION SHOWING THE POSITION OF THE VARIOUS MACHINES AND APPLIANCES—REASONS FOR LOCATING THINGS WHERE THEY ARE

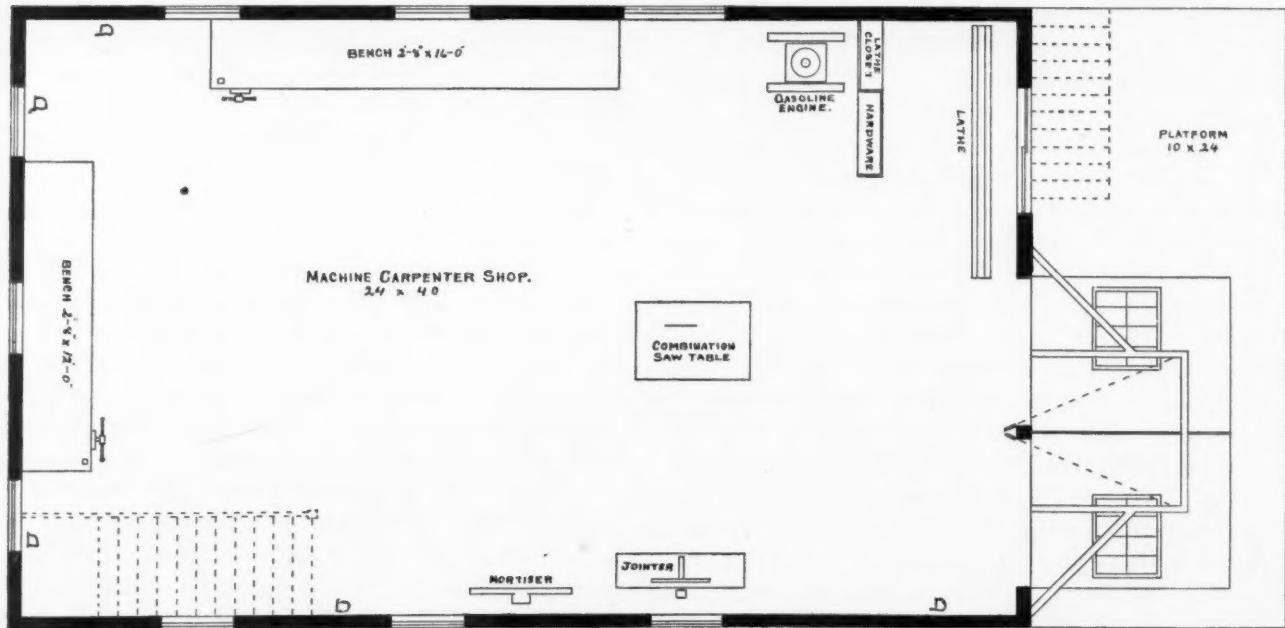
By J. E. Jones

I AM herewith showing the floor plan and interior elevation for a "Machine Carpenter Shop" and trust that they will be a great help to the bright "small town builder"—in fact, I have been through

the mill myself. The plan submitted, you will see, is somewhat larger than the one published in the June number. I have made it so for several reasons. First, you did not allow room for stock being milled



and no space whatever to make window frames, counters and other store fixtures, which all live builders are sure to be called upon to build. Any builder in need of any machinery at all must have room for the storage and milling a considerable amount and variety of stock. Now suppose that during the rush season that three men are employed. One machine hand, one bench hand on general work and one on frames, etc., even I have not allowed any too much space. You will see that I have arranged for a combination saw table, a twelve-inch jointer



and ten-foot lath shears and a foot power mortise. I have placed two doors at the end of the shop. These to swing up. They could be weighted so as to balance or nearly so in each of these doors. I have planned to put a sash to slide up to allow long stock to be ripped or jointed. By hanging the doors in the manner shown the shop would be practically lengthened about eight feet and in cold weather the sash could be raised just enough to allow for long stock to pass out. There being so many different kinds of locations and sizes of lots that it would be hard to say just where it would be best to place the doors, therefore I have marked on the plan several available locations. As you will see, I have also planned for a small lot by making a general stock room at grade. The case of shelves placed near engine answers the double purpose of hardware shelves and a shield to the engine from the lath chips. I have shown drawers in the benches for the reason that this is always dead or lost room. Besides it is much more convenient for tools than a chest. One drawer could well be used for sandpaper, brass screws, etc.



Take time to think, plan, and act.

That Expensive Hen House

At a recent meeting of the Chicago Architects Business Association, Peter B. Bartzen, our energetic building inspector, related the following story. Mr. Jones had long wanted his boy Ezekial to learn a trade and after much thought he decided he was best qualified to become an architect. Taking him to a prominent architect's office in the city he told them of his wishes with regard to Ezekial and they asked him "What has your son done to make you think he would make a first-class architect?" "Why," remarked Mr.

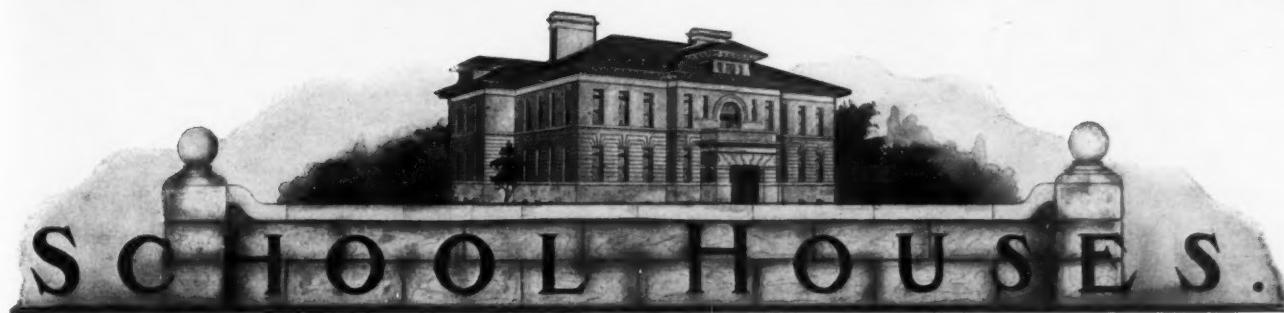
Jones, "he planned and figured out the cost of a hen house on my farm and when it was finished it cost just twice as much as his figures and I said, that boy of mine has the making of an architect." After Mr. Bartzen had concluded, Normand S. Patton, president of the association took up the story in the following manner:

"That story Mr. Bartzen told is only too true and I was interested enough in the case to find out where the extra cost came in. I went to Mr. Jones and asked him about it and with tears in his eyes he related his sad experience. He said: 'After that hen house was finished, or we thought it was finished, the building inspector came around and made us put wire glass along the entire alley, two extra stairways to the hen roost, one fire escape and a red light at every exit. Those red lights were our downfall, for the hens always thought it was sunrise and kept cackling until some died of sore throat and others from loss of sleep. That's where the extra cost came in.'



Puzzled

I know some terms of carpentry,
Yet this—what meaneth it?
They tell me he who takes a brace
Must no more touch a bit.



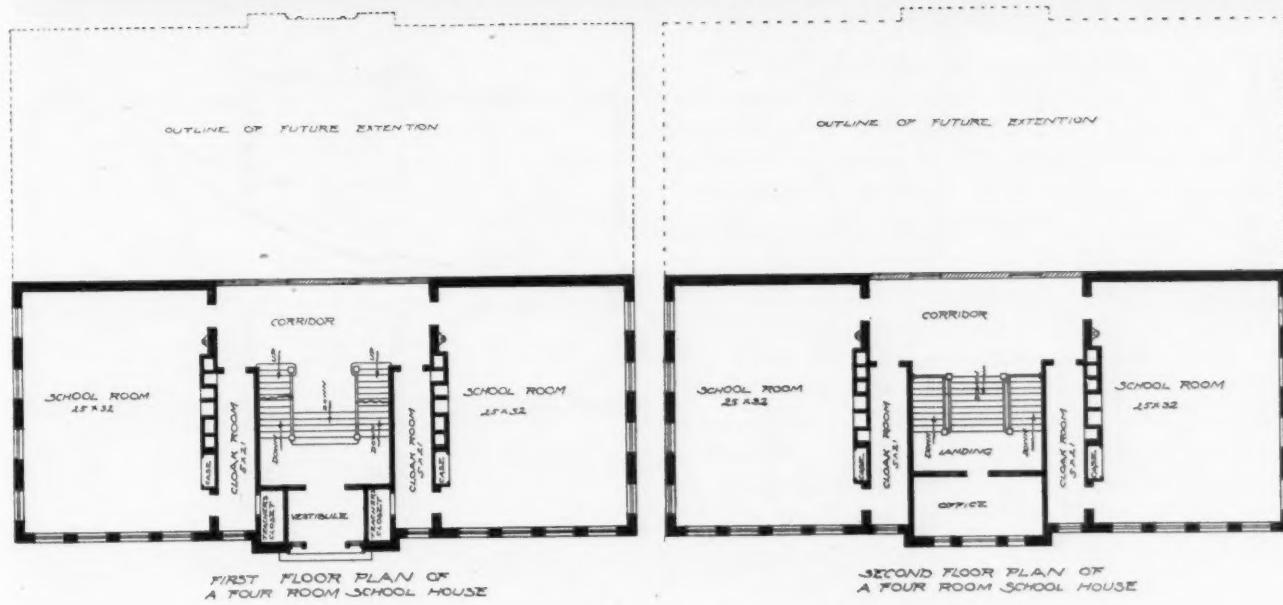
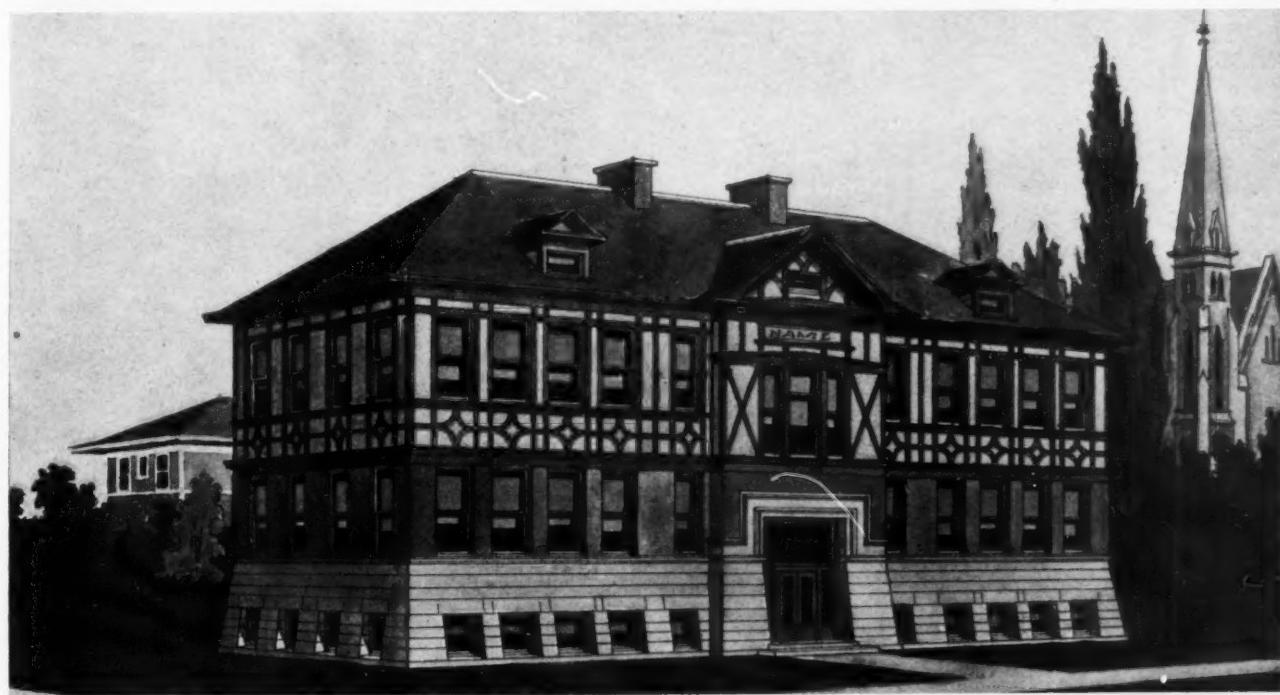
SCHOOL HOUSES.

Public School Building

SHOWING DETAILED CONSTRUCTION OF ALL PARTS OF THE BUILDING—METHODS OF DEADENING FLOORS SHOWN, AND SIZE OF TIMBERS USED

We are this month illustrating the perspective and floor plans of a four-room school house designed by G. W. Ashby, architect, showing the outline of four rooms which can be added

any time that necessity demands. This is being done quite frequently in new communities where there is every prospect that at some future time they will be obliged to increase the capacity of their school build-



ings. The building here shown is an entirely new departure from the stereotyped brick building which has been so common in the past. The construction from the grade to the window sills is of stone and from the first story window sill to the panel work is of pressed brick. The second story wall is of common brick laid off in a timber design as shown with rough cast plaster in the panels. The roof is of slate. The difference in cost between pressed brick and the common brick which is used in the second story wall more than offsets the cost of panelling and rough plastering.

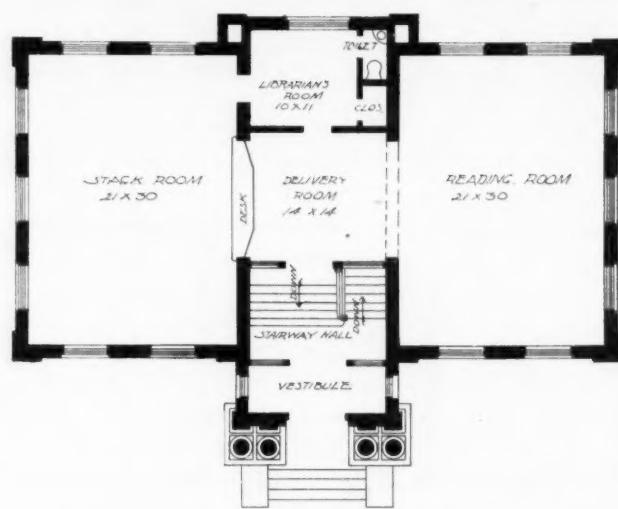
The interior finish is in oak and instead of having a wooden wainscoting cement plaster is used. This extends from the floor to the window sills and under the blackboards. This is done for hygienic reasons as cement plaster is more sanitary than wood. There are twelve-foot ceilings in the basement. The basement contains toilet rooms, a boiler room, fresh air rooms and one large room which can be used for manual training. The building is heated by means of low pressure steam and is ventilated over heated coils in the fresh air rooms in the basement.

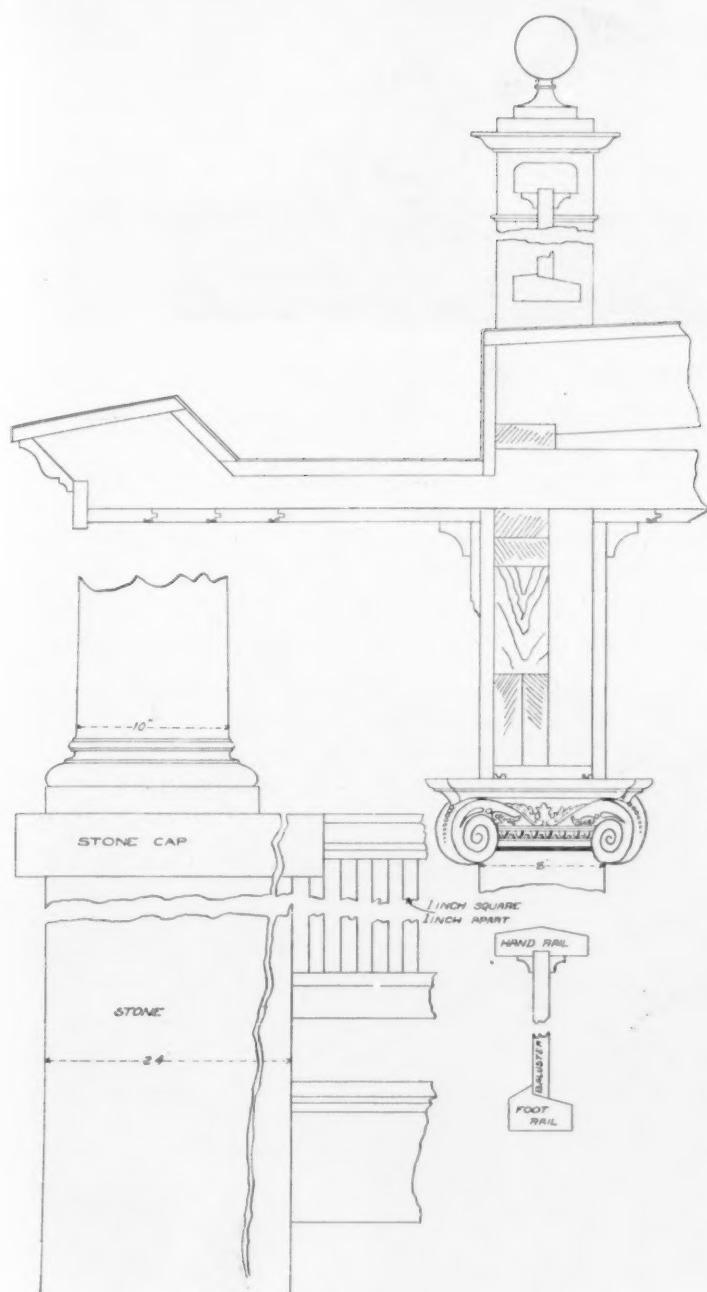
Modern Low-Priced Library

SUBSTANTIAL BUILDING WHICH CAN BE ERECTED AT MODERATE COST—DESIGNED ALONG MOST MODERN IDEAS—
FLOOR PLAN SHOWS INTERIOR ARRANGEMENT

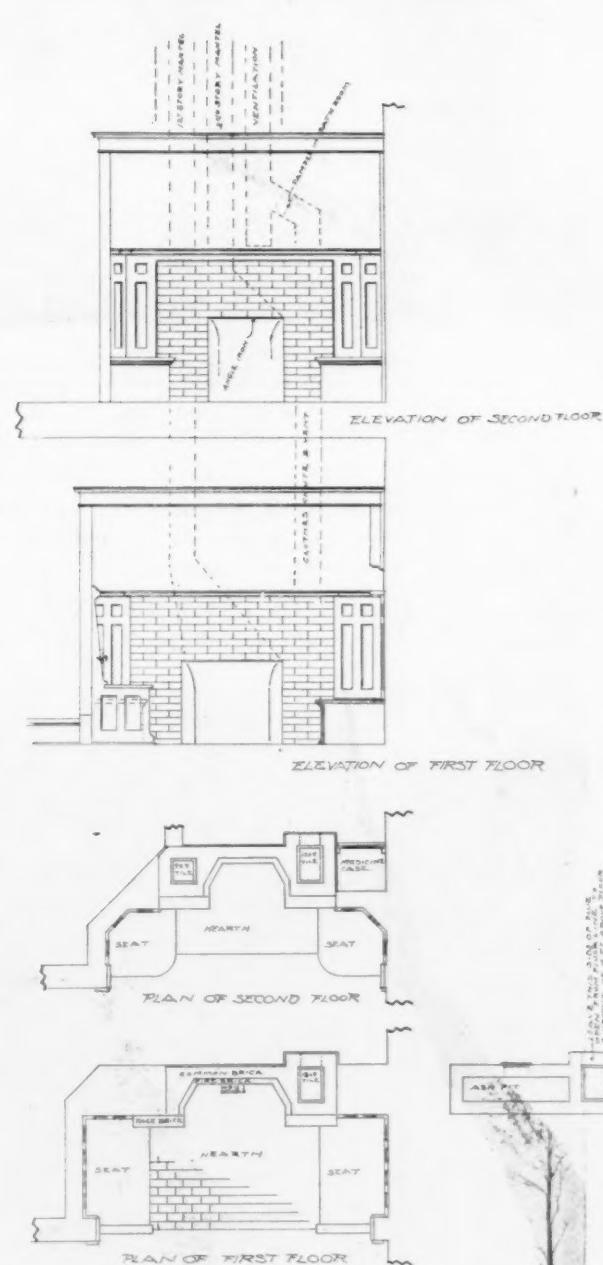


THE library shown herewith is a modern low-priced substantial building. It is constructed of stone up to the water table and the rest of dark red paving brick. The cornices are of copper and it is covered with a composition roof. The corners all have pilaster effects and the stone columns are capped with Ionic caps which give a very striking effect. The basement which extends under the building is divided into toilet rooms, boiler room and an extra reading room. The main floor is divided into a stack room, reading room, delivery room and librarian's room. The building is heated by means of hot water. A hot water system in a library is far preferable to steam or hot air, as the heat is more moist and does not have the serious effect upon the books that the dry heat has.

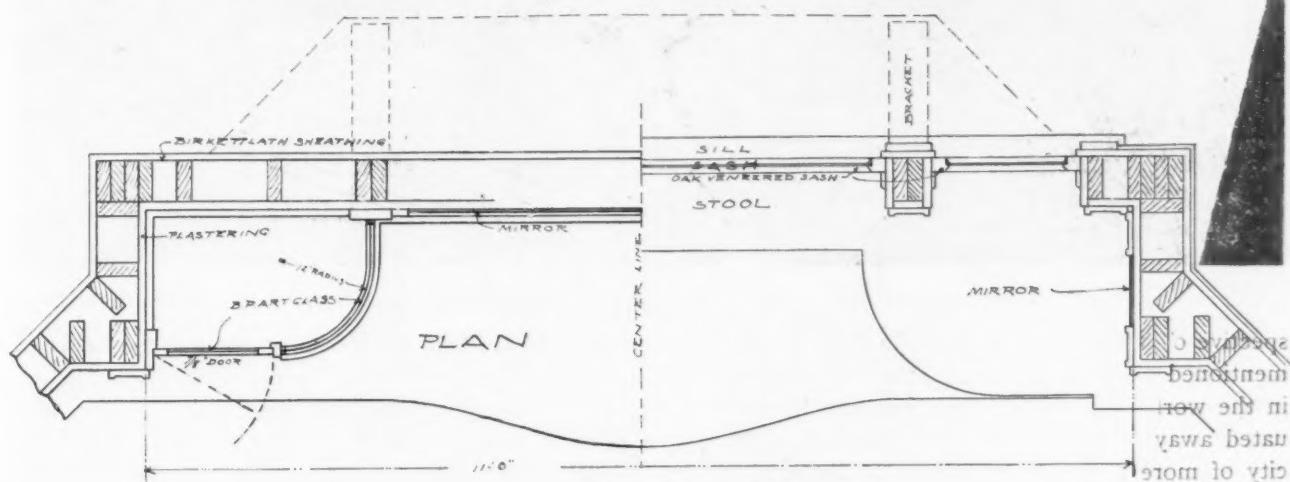




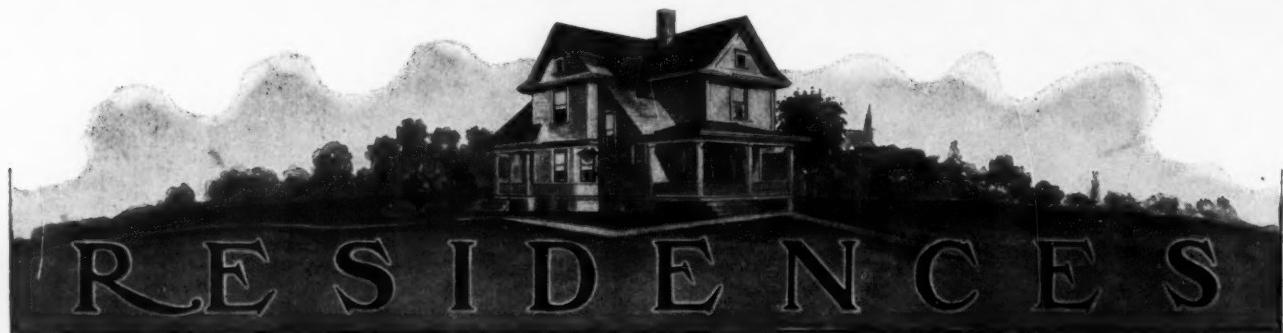
Detail of a Porch



Detail of a Fireplace



Detail of a China Closet



Three Representative Homes

PERSPECTIVE AND FLOOR PLANS OF WILLIAM JENNINGS BRYAN'S HOME — TWO OTHER RESIDENCES SHOWN WITH DESCRIPTIONS OF EACH

KNOWING that the readers of the American Carpenter and Builder are interested in the planning of the home and especially those of noted men, where they live, and their surroundings, we are this month showing on this page, the floor plans and a photographic per-

standing on a gently rising knoll, from which a splendid view is had in all directions over hill and valley for miles around, and especially so at this time of the year when the autumn leaves take on their loveliest hue and nature smiles on the efforts of the sturdy sons of toil in producing the boun-



"Fair View," Home of William Jennings Bryan

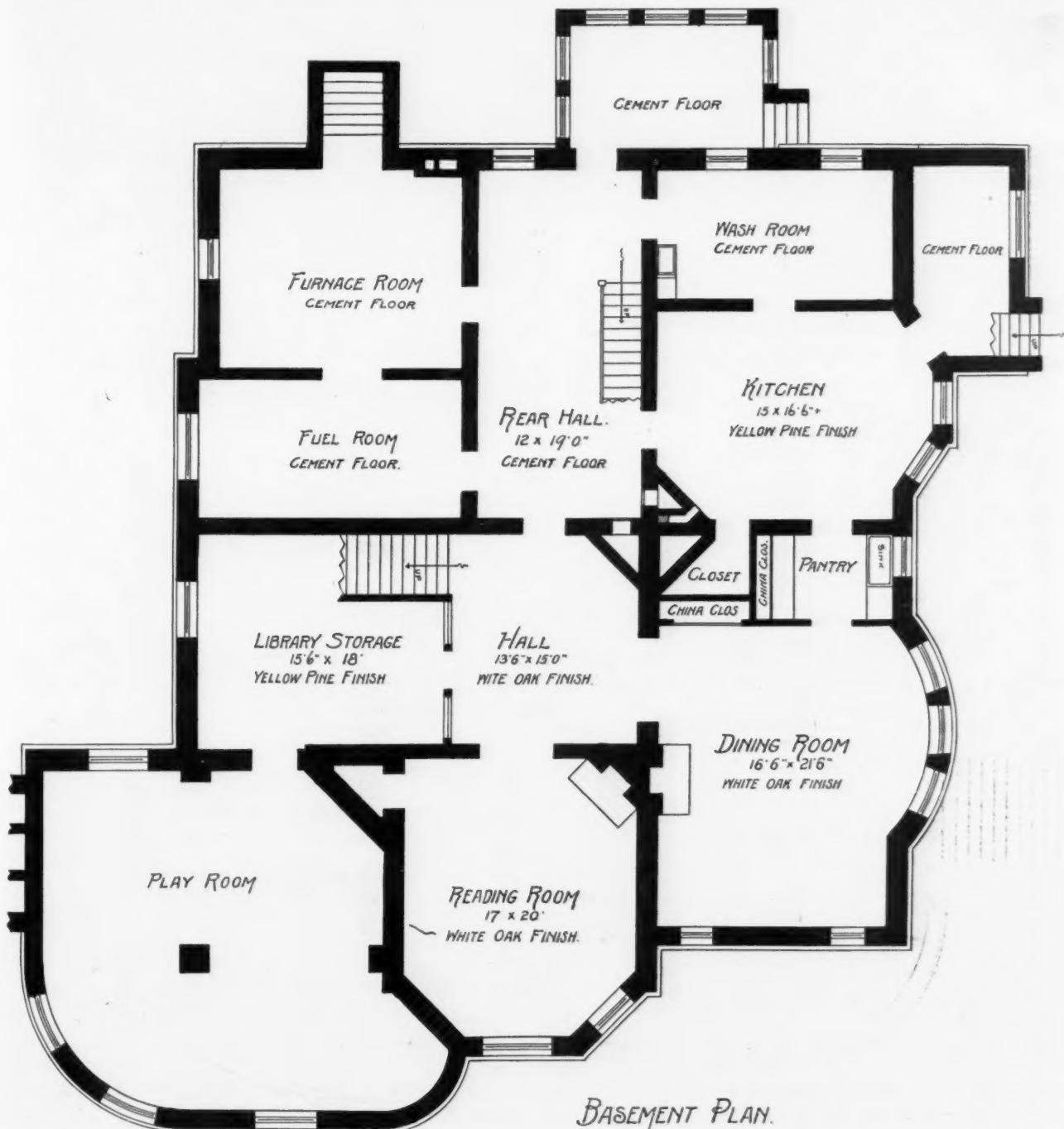
spective of the home of one whose name is probably mentioned more at this time than any other man in the world, that of William Jennings Bryan. Situated away from the noise and bustle of a thriving city of more than 50,000 people, is the modest but substantial home, called "Fair View," for such it is.

ous crops of King Corn, and sweet scented fields of alfalfa. It is here Mr. Bryan chose to build his home, some four miles east and a little south of the city of Lincoln, Neb. But if Mr. Bryan chose this place for quiet and rest, he made a mistake, for he probably has as many callers at his suburban home

as when he lived in the city proper, for it is an elegant drive along the boulevard that passes near his place. The trolley cars also pass near by on their way to the suburban villages of Normal and College View, which furnishes an excellent way of viewing the home, and many strangers avail themselves of

to him like Fair View and the modest little M. E. Church at Normal, the Bryans' place of worship.

But let us look at the arrangement of the home. It is situated on a tract of about 100 acres. For this reason, Mr. Bryan is often dubbed as "Farmer Bryan." The house, we are told, was largely planned



BASEMENT PLAN.

that opportunity, while temporarily stopping in the city.

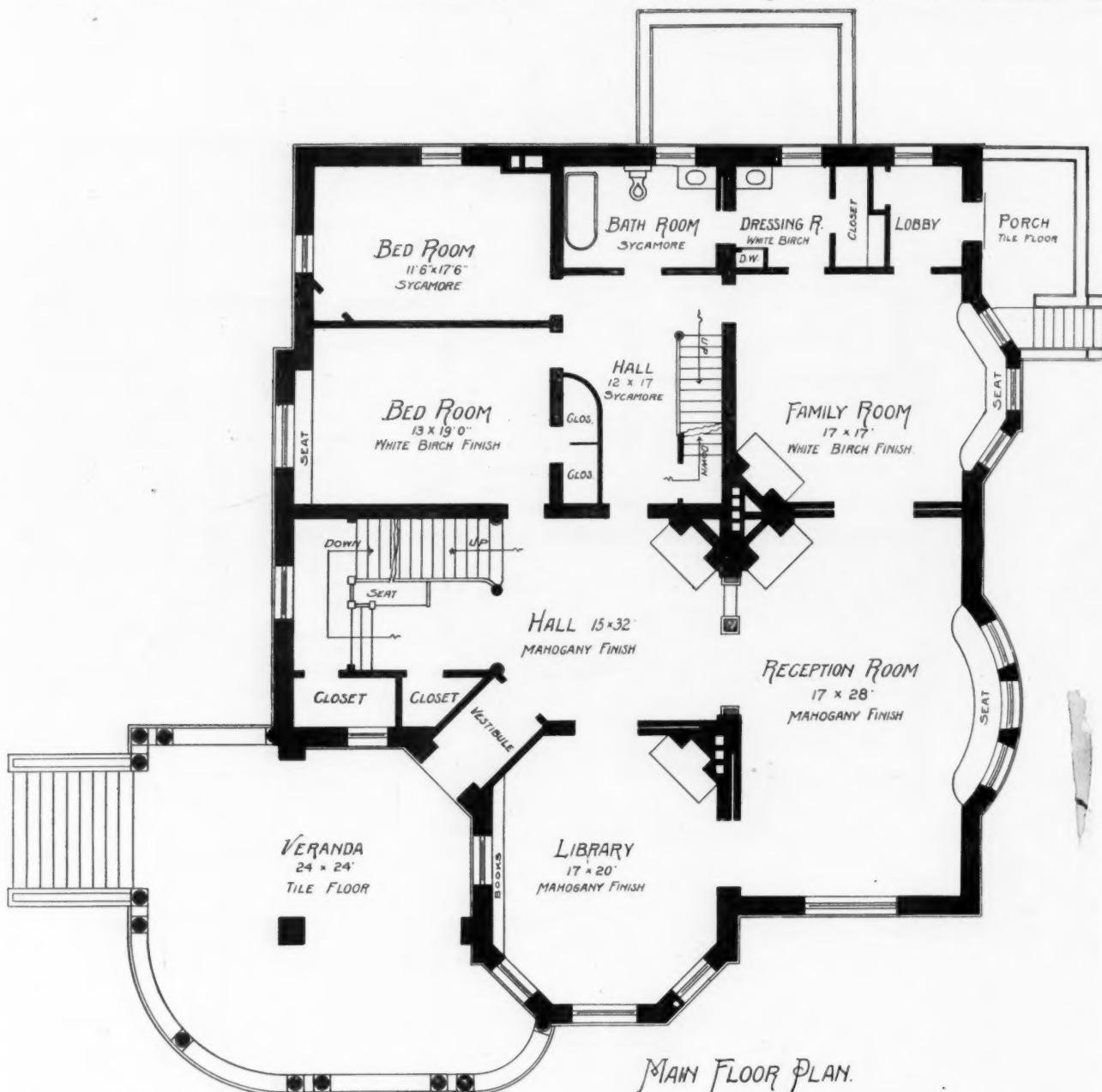
While it might truthfully be said that Mr. Bryan's home is on the run, as we hear of him in this place today, in another tomorrow, and in a far distant one the next day, but wherever he happens to be, he may always be found in the house of worship on the Sabbath day, but it is safe to say there is no place

by Mrs. Bryan, and put in working order by Mr. Roberts, a local architect. It is very substantially built, using the best of material throughout, as will be seen by the finish in the different rooms. The first floor is simply a high basement, in which are located the kitchen, dining-room, and a reading room, for the more heavy periodicals, besides containing a number of other rooms. On the second,

or main floor, are located the reception and family living-rooms. The third floor contains six sleeping rooms, provided with all modern conveniences. The heating is by hot water system, besides containing six elegant mantel fire places. The house was erected about four years ago, which accounts for the absence of stately shade trees, but the planning has

There are, however, a good many people in this country who like to have the front hall connected with the kitchen and they have a perfect right to their preference.

Another English feature about this house is the fireplace in the hall, but there are not so many bald-headed men in England as there are in America. We



MAIN FLOOR PLAN.

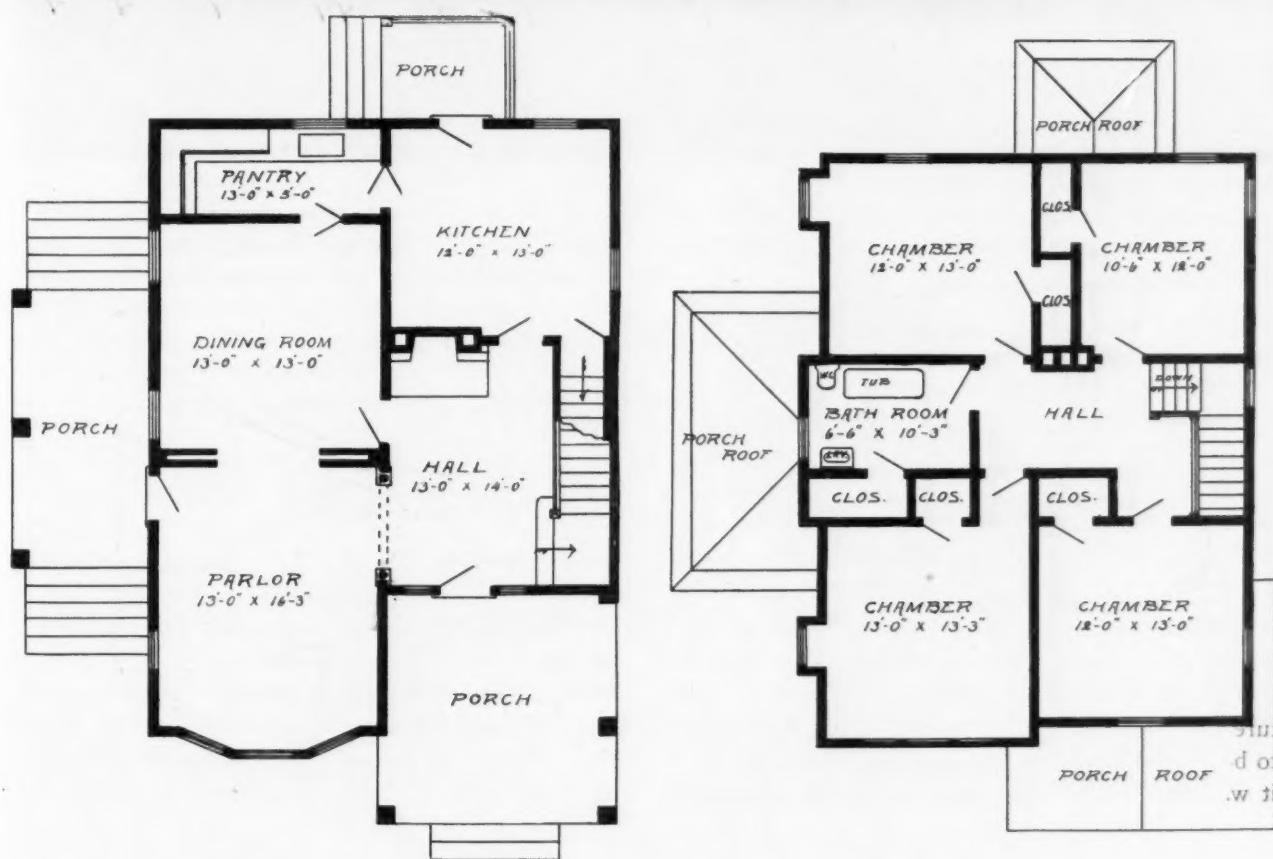
been along broad lines, and in time nature will supply all that can be desired in making a beautiful home. It is said the cost was in the neighborhood of twenty thousand dollars.

An English House

On page 941 is a house a little on the English order. Every English house must have a direct connection between the front hall and the kitchen. Custom means a great deal to all of us but our English relations probably are a little more tenacious in their opinions and habits than other branches of the Anglo-Saxon race.

think more than they do, which wears the clinches off. Forever afterwards we object to sitting in a hall where the circulating medium is cold air which comes racing down the stairway to hunt all the odd corners in that part of the house. But an open fire in the hall is cheerful in America as well as England. A good many housekeepers like the looks of a nice grate and mantel whether it holds a fire or not.

This style of roof gives room enough upstairs for four bedrooms and a bathroom with closets enough to satisfy a woman and this is saying a good deal. There



is only one chimney in this house but that fills the bill in a very satisfactory manner. The arrangement of the rooms both downstairs and upstairs are such that the house is very easily heated. There are no long furnace pipes necessary to reach any room. There are

big enough to hold a rocking chair but every decade marks an improvement in this respect.

A Gambrel Roof House

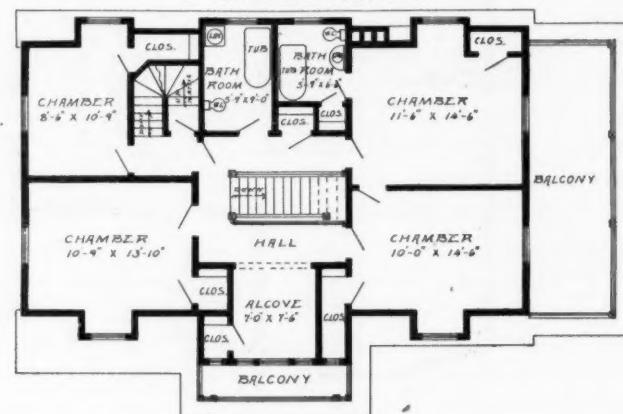
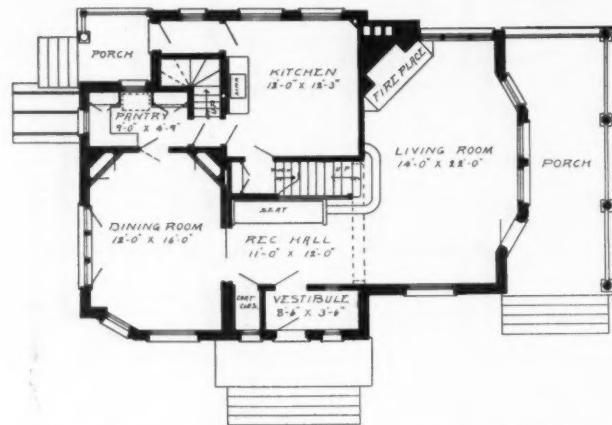
What was once considered a very homely roof has come into favor very fast during recent years. We



no cold rooms except the pantry and that should be cold. The side porch on this house is a pleasant fea-

ture that looks well and is comfortable. There seems to be a growing demand for porches. Forty years ago it was common to see a good house without a porch

(Continued on page 946)





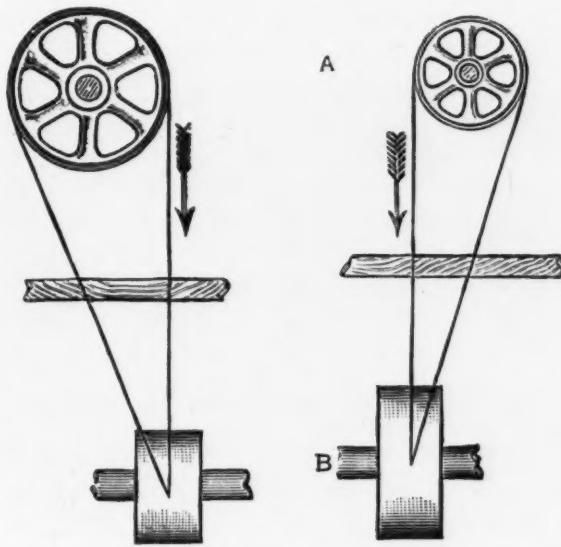
Setting Pulleys for Belts

BEST KIND OF PULLEY TO USE FOR GENERAL PURPOSES — ADVANTAGES OF A SPLIT PULLEY — RULES TO FOLLOW IN SETTING PULLEYS

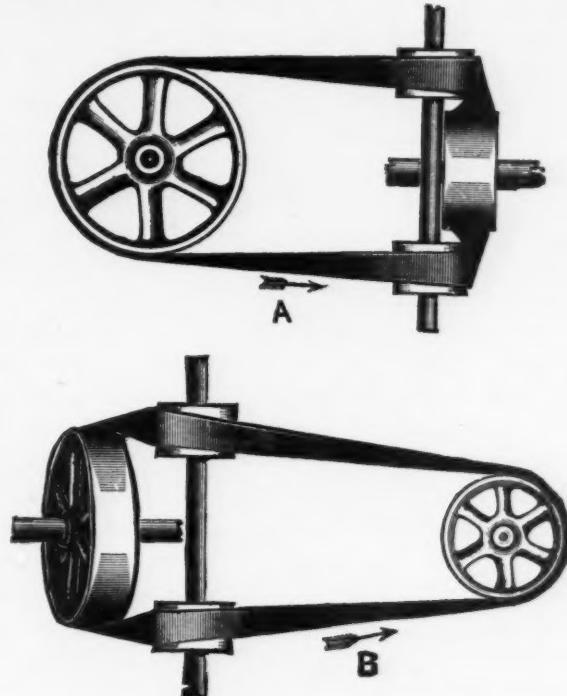
IN the setting of pulleys for belts almost every mechanic is pretty familiar with the general rules that apply, those of aligning up faces and leveling up shafting. It's a comparatively simple job after shafting it put level and in align, to align up pulleys with each other by their rims. But, when

pulley should align with the face of the driver, and some get mixed up with it one way and some another, but by reference to the accompanying diagram a little thought on the subject will serve to set one straight on this point, which is really very simple, but is quite frequently a stumbling block just the same.

Another simple matter that gets mixed at times is that of driving shafts at right angles to each other without using a bevel gear. Gear drives are noisy, and give dissatisfaction in several ways, consequently it is not unusual to want to dispose of them by using a belt, especially where there is anything like high speed, because the work is done much



we get away from simple drives there are some pretty good mechanics that become mixed in their ideas. One common stumbling block of this kind is in setting pulleys for what is known as a quarter twist belt. Not a full twist belt, or half turn, but a quarter turn, such as occasioned by driving an upright shaft from a horizontal shaft, or vice versa. Many people get the idea in their heads that pulleys should be aligned on centers, and at times it is very difficult to get this idea out. The true and only way to align for a quarter twist belt is, from the face of the driving pulley to the center of the driven pulley. Then following back from the driven pulley to the driver on the return the same rule holds good, and one must drive from the face to center. This is illustrated in the accompanying drawing which shows two views of the same drive. Some people make the mistake of thinking the outer edge of the driven



more smoothly and with very little noise when belts are used instead of gears. It's a very simple problem, too, when the shafting is all in the same place. That is, level with each other. All one needs is a plain mule stand with two loose pulleys to carry the belt on the driving and return side, around the cor-

ner, so to speak. The method of aligning these is pretty much the same as that of aligning a quarter twist belt and the setting is illustrated herewith.

The time and place where some people get tangled up on this, is when the shafting is not in the same plane. Say the shaft to be driven is either above or below the driver, then you are in trouble, you've got a mean drive to handle, and there is really only one way to do it with, and that is with what is known as a universal mule stand, one that has the pulley spindles supported in a ball and socket joint so that they can be set at any angle. Then, bear in mind the theory of aligning quarter twist belts, set these mule pulleys as near to it as you can come, start your machine up, and if your belts track all right, well and good; if not, you'll have to do a little shifting, a little "cutting and trying" as we used to say, until you get the right adjustment.

The most difficult thing about setting shafting and pulleys, and a thing that should have the closest attention, is the fastening of the pulleys to the shaft. I am speaking of the pulley that is to do hard service. You can take a light pulley and fasten it to the shaft with a set screw, but for serious work a set screw is not much better than a make-shift, because the bearing surface of the screw on the shaft is too small, it scars up the shaft, and if the pulley ever slips it cuts a ring around it, and it cuts various objectionable capers that makes it objectionable to experts in this work. It continues to be used though on pulleys for light work, because of its convenience. Really the best way to put a pulley on a shaft is to key it on, and that is where we get into the most difficult job about setting pulleys. The key seat in the pulley must be exactly the size of the seat in the shaft and the key should fit snugly from end to end. That sounds simple, doesn't it? It's not half as easy as it sounds, and really calls for microscopic work, something the average carpenter is not accustomed to doing every day. That's what must be done though if you want a pulley to give the best satisfaction. If you don't attend to it carefully, if you make the common mistake of having a key with too much taper, that fits tight on the outer end while it is loose at the point, the key will work out. In fact, it's better to have it tight at the point instead of tight at the heel and loose at the point. But, the best thing is to have it fit snugly all the way through. Then when it is driven home firmly it will stay there and pull the arms out of the pulley before turning loose.

Next to the keyseated pulley, the best way to fasten a pulley for general purposes is to have it a split pulley, bushed so that it will just grip the shaft tightly when the bolts are screwed up. The split pulley is made in both metal and wood, but most extensively in wood, and it has so many good points

about it that it should be a special favorite with small planing mill men, where the work is comparatively light. With pulleys of this type you don't need to have any keyseats in your shafting, you don't have to fit in keys or worry with any set screws that mar up our shaft, you don't have to slide a whole string of pulleys on to a shaft, but you can put the shaft in place and put each pulley in place and then bolt it on. Then, at any time in the future when you want to take a pulley off from any cause or other, you don't have to take down the shaft and strip it, you simply loosen up the pulley and take it apart. Also, if you want it transferred from one shaft to another, and the shafts differ in size, all you need is a new bushing bored to the size of the new shafting. In fact, there are so many advantages in the use of the split pulley, that except for specially heavy drives, where the keyed pulley is an essential, the split pulley should be pretty generally used. While, as stated, it is made both in metal and wood, there are about four or five different styles of split pulleys. There is the regular cast-iron pulley which is bored the regulation way and split, there is the regular wood split pulley, wooden arm, bush and all, there is the pressed steel split pulley, which is made of comparatively thin steel pressed in dies, and there is the wood and iron pulley, a pulley having a wooden rim and an iron hub and spokes, and then there are several minor variations, so you can pay your money and take your choice, but always bear in mind that a split pulley is a mighty handy thing.



Building Materials in Morocco

The attention of manufacturers is invited to reports from Tangier that there is a large and increasing demand in that part of Morocco for cement and building materials of all descriptions. The reason of the increase in the importation last year of cement, bricks, tiles, hardware and furniture is to be found in the great stimulus experienced in the building trade. The right of foreigners to acquire land having been confirmed by the powers represented at the Algeciras conference, the demand for building materials of all descriptions, as well as for furniture, will, it is said, increase considerably. The furniture required is of a cheap and light description. There is a demand also for stationery and for note and account books. There is sure to be a great demand for tools of all sorts and descriptions, and all the many conveniences required for a modern town will be in demand. The import of British hardware fell 13 per cent during the year, the British percentage being absorbed by Belgium and France, from which two countries steel and iron girders and ironmongery of all descriptions were imported in large quantities.

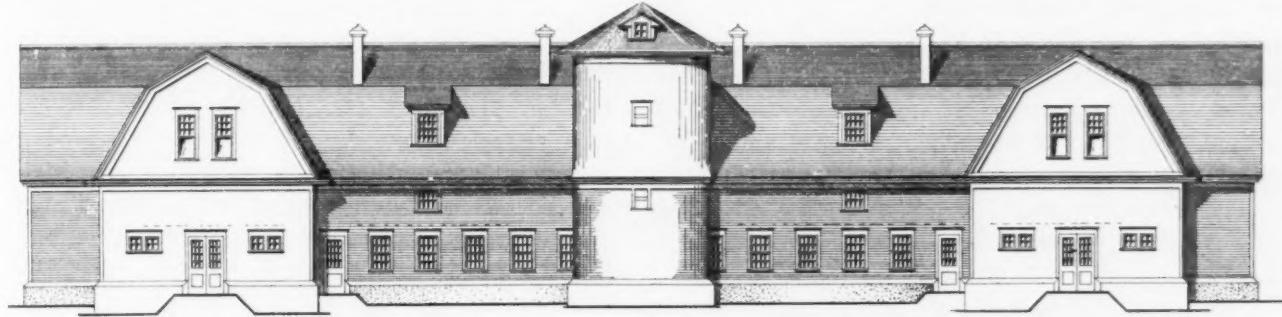


A Pretentious Stock Barn

CAREFULLY PLANNED AND ARRANGED WITH REFERENCE TO STORMS AND PREVAILING WINDS—INTERIOR ARRANGEMENT AS ECONOMICAL AS POSSIBLE

THIS pretentious stock barn is very complete and of an elastic pattern, so designed that its capacity can be increased by building on to the gable ends and extending them out any distance that may be required without affecting the general arrangement or the exterior architectural

with reference to feeding, being in the middle of the cow barn. The cows stand back to back, which is of great advantage in cleaning out the gutters, as all the dirt can be handled from the center driveway and carried to the manure pits to the right. To the left hand or west end of the cow barn is a large

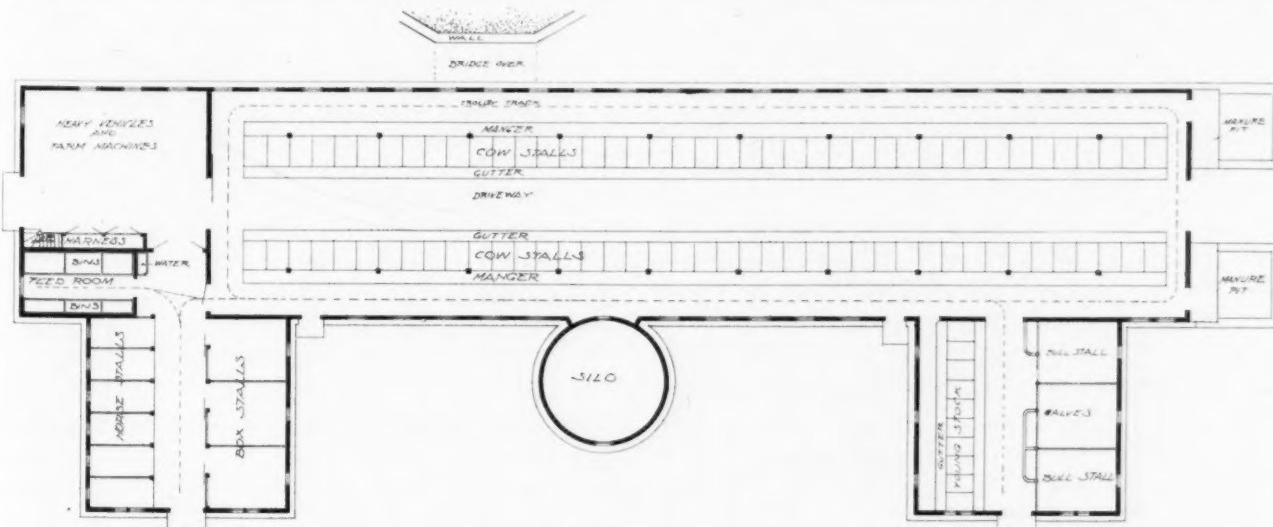


SOUTH ELEVATION OF STOCK BARN

proportions in the least. The two wings to the right and left of the silo contain the young stock and horses respectively and face the south. These two wings form a sort of court around the silo, admitting the sun, but obstructing the severe storms and giving shelter to the stock. The silo is well situated

room for implements, wagons, harness cases and stairways to upper floor, which contains grain bins, storage rooms for light machines, vehicles, etc., and sufficient hay and feed room for all stock.

This building has a concrete foundation with the concrete walls extending about 2 feet above the



cement floor level in the stock rooms. This prevents any moisture from getting to the framework and also makes a very sanitary and durable building. The frame walls are constructed of 2x6-inch studing covered with tar paper and drop siding on the outside and tar paper and matched sheathing on the inside.

The lower story has two rows of posts which support the upper floor and also serve to hold the stanchions and stall partitions. The upper story is of a single span, braced roof which allows the free use of a trolley hay fork the full length of the building.

The roof is of green stained shingles, of Dutch Colonial architecture, and not only of a very appropriate design, but its shape adds greatly to the storage capacity of hay, grain, etc.

There is an embanked driveway on the north side which admits hay wagons into the upper floor for the unloading of hay, grain, etc. The silo is of frame construction lined on the inside with paving brick, making it absolutely air tight and almost frost proof. There is a trolley track feed carrier hung to the ceiling of the lower story, which simplifies the feeding. The building, as the cut shows it, will accommodate 100 head of cattle and nine horses.

◆ A Gambrel Roof House

(Continued from page 942)

on the other side, but there is a vast difference in the amount of available headroom when you come to finish off the upper story. Utility first, beauty in design second has been the order in regard to gambrel roofs. The public have become accustomed to seeing them and persons no longer face such a house with their mouths open, wondering what will happen next.

This is not a large house by any means but there is an elegant living room, a twelve by sixteen dining room and a good comfortable kitchen on the first floor besides other conveniences and four good bedrooms, two bathrooms and an alcove for the children upstairs and the rooms are all large, well lighted and conveniently arranged. The plan of putting two bathrooms in a house is a good one. The more civilized people become the more use they have for bathrooms. Where there are several persons in the family who are obliged to get away to business early in the morning and where the men folks make a practice of washing and shaving in the bathroom, as they should do, this extra convenience will be thoroughly appreciated. The time will come when bathrooms will be a great deal more common than they are now.

The two story porch on the right wing is a comfortable proposition. It is large enough to accommodate a good sized company down stairs and the upper part comes in handy at night when you want to sit outside in dishabille to cool off while you fight mosquitoes before going to bed.

Wetting Lead Pencils

The act of putting a lead pencil to the tongue to wet it just before writing, which is habitual by many people, is one of the oddities for which it is hard to give any reason, unless it began in the days when pencils were poorer than now and was continued by example to the next generation. A lead pencil should never be wet. It hardens the lead and ruins the pencil. This fact is known to newspaper men and stenographers. But nearly every one else does wet a pencil before using it. The fact was definitely settled by a newspaper clerk away down east. Being of a mathematical turn of mind, he ascertained by actual count that of fifty persons who came into his office to write an advertisement or a church notice, forty-nine wet a pencil in their mouths before using it. Now, this clerk always uses the best pencils, cherishing a good one with something of the pride a soldier feels in his gun or his sword, and it hurts his feelings to have his pencils spoiled. But politeness and business considerations require him to lend his pencils scores of times a day. And often, after it had been wet till it was hard and brittle and refused to mark, his feelings would overpower him. Finally he got some cheap pencils and sharpened them, and kept them to lend. The first person who took up the stock pencil was a drayman, whose breath smelt of onions and whisky. He held the point in his mouth and soaked it several minutes, while he was torturing himself in the effort to write an advertisement for a missing bulldog. Then a sweet looking young lady came into the office, with kid gloves that buttoned half the length of her arm. She picked up the same old pencil and pressed it to her dainty lips preparatory to writing an advertisement for a lost bracelet. The clerk would have stayed her hand, even at the risk of a box of the best Dixon pencils, but he was too late. And thus that pencil passed from mouth to mouth for a week. It was sucked by people of all ranks and stations, and all degrees of cleanliness.—Graphite.

◆ He was the Boy

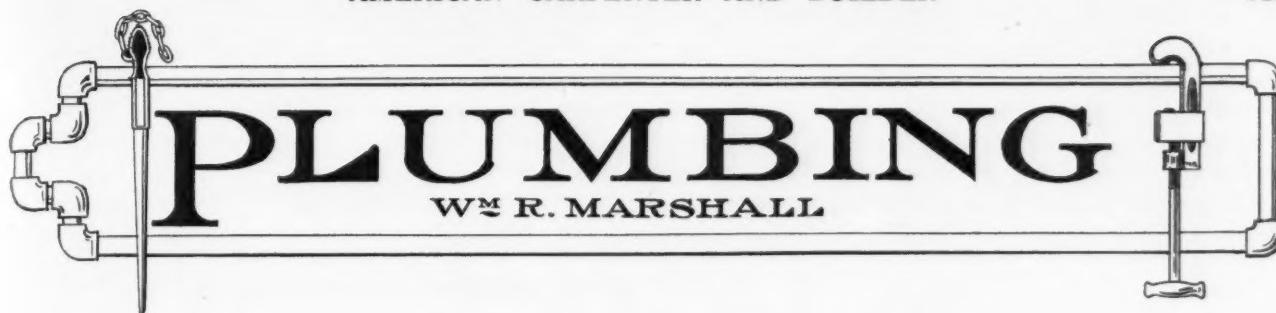
A contractor directed one of his clerks to hang out a "Boy Wanted" sign at the street entrance a few days ago. The card had been swinging in the breeze only a few minutes when a red-headed little tad climbed to the contractor's office with the sign under his arm.

"Say, mister," he demanded of the contractor, "did youse hang out this here 'Boy Wanted' sign?"

"I did," replied the contractor sternly. "Why did you tear it down?"

Back of his freckles the youngster was gazing in wonder at the man's stupidity.

"Hully gee!" he blurted. "Why, I'm the boy!" And he was.



Inspection Tests

VARIOUS METHODS EMPLOYED TO TEST WHETHER OR NOT THE PLUMBING SYSTEM IS PERFECT—HOW EVASIONS ARE SOMETIMES MADE

AFTER a building is roughed in for the plumbing fixtures, i. e., after the soil and vent pipes have been installed, the entire system should be tested before the pipes are covered up in the walls. A cracked pipe, a split fitting, a sand hole or an imperfect joint, which would permit of the escape of sewer gases, might do irreparable damage after the house was occupied. Too great care or pains cannot be exercised in making sure that the entire system is gas tight before being covered. Precaution should be taken against pipe stack settling and straining the joints by an adequate pier of brick, stone or

water to show any imperfections in the work. The air pressure test is made by closing both ends and all openings with plugs and filling the system with air with a force pump and a mercury column; ten inches of mercury should be maintained in the glass. If the mercury is maintained at this point for 30 minutes, the job is tight, a gradual descent shows a small leak, while a rapid descent shows a large one. Spring gauges are generally tabooed by good plumbing inspectors as being too unreliable and too easy to tamper with. To show to what pains and ingenuity some men will go to avoid taking down a stack or cutting out a split fitting I want to mention a little incident I witnessed in a large city several years ago. The plumber had in caulking carelessly cracked a four-inch sanitary tee on one of the main stacks at the second floor line, and instead of cutting it out and doing the work right he let it go, with the remark, "that will never be noticed, and it will save me several hours' time if I can beat the inspector on this particular stack." As the inspector was due to arrive any moment I waited to see how the trick was done. As I was positive if that stack was ever filled with water the twelve or fifteen-foot head of water above it would cause the crack to show a leak. But my plumber friend did not intend to fill the stack, although he knew that the inspector expected was a very strict and painstaking man, and would not take his word that the stack was full of water but would get up on the roof and look into it. What he proceeded to do was to cut a piece of wood in circular form a trifle tight for the pipe extending through the roof, drive a nail into the center of it, and attaching a short piece of stout cord to the nail and securing a hand full of putty climbed up on the roof and placed the circular plug down in the pipe as far as he could reach, and after putting up the crevices around the circumference, proceed to fill the pipe full of water from a two-gallon bucket. When the inspector arrived he climbed to the roof, looked into the pipe, full—he then proceeded to examine the stack all the way down for leaks. While he was on his way down Mr. Plumber reached down, caught hold of the string, jerked out the plug, shied it over several roofs and leisurely climbed down to the first floor, where

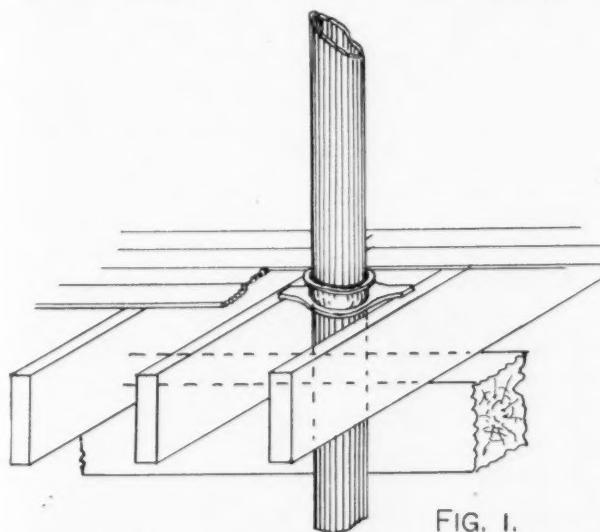


FIG. 1.

concrete at the foot of every soil, rain or waste pipe, and these pipes should also be braced or supported between floors with soil pipe rests under the hub of each pipe, as shown in Fig. 1. Pipe hooks should not be permitted for this purpose, as they are liable to bend or work loose. In buildings which are subject to vibrations from operating machinery or subject to any other causes which would have a tendency to loosen caulked joints, pipes with caulked joints should not be used. After being satisfied that your roughing in work complies with that of the above requirements you are ready to test the system which can be accomplished by several methods. The water pressure test is made by closing the lower end of the main house drain and filling the pipes to the highest opening above the roof; this will provide sufficient head of

he opened the test plug and let the water run out, and by the time Mr. Inspector was through examining the stack and had come to see the water discharged (he was a careful inspector) he found the pipe empty, on asking the reason for it the plumber innocently asked, "didn't you yell O. K. five minutes ago? I thought you did; but any way you can see that it was filled; look, the outlet is still wet"—and the inspector's paster went on the stack—O. K.

After the fixtures are installed the entire job should be submitted to a final test; the most common method employed is known as the peppermint test, about four ounces of oil of peppermint (for every stack for an ordinary two-story residence) is poured into the stack outlet, extending through the roof, and about three gallons of hot water to wash down the fumes. The top opening is then closed. If an odor of peppermint is perceptible inside of the house there is a leak some place, and its pungent odor will generally locate it. Another method of testing the entire job is to close the outlets, both top and bottom, and apply the smoke test, which consists of forcing a volume of dense smoke into the pipes with a machine which is made for that purpose, consisting of a small hand blower attached to a smoldering chamber, which is filled with slow burning, heavy smoke producing material, such as a hand full of oakum. This machine is adjusted so that the pressure maintained in the system is just under the point at which the water seal of the traps would be broken. A smoke chamber floated in water rises as the system becomes filled with smoke and is forced to open to atmosphere at the seal breaking point, so that it is possible to know by the position of the smoke chamber just what pressure is on the system and whether it is being maintained; any leak is easily located and fault corrected.

Draining a Basement

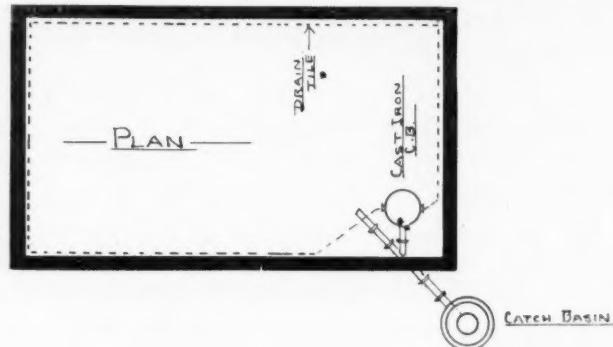
To the Editor:

Glen Elyn, Ill.

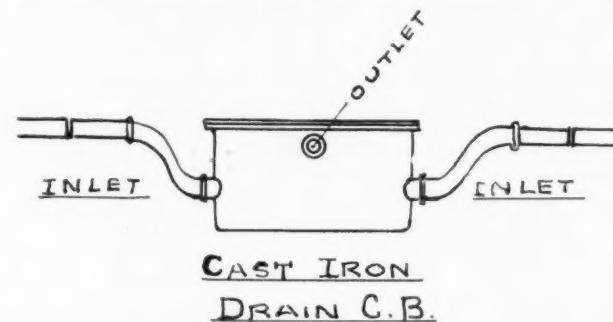
Will you kindly answer the following question? Our house is built on a slope, the land back or south being higher than the site. The ground slopes off to the north or front and also to the east. The house was built last fall with basement of cement. Last February we had eighteen inches of water at times over the floor. No tiling was done at the time the house was built. We now wish to tile with three-inch porous tiles around the interior wall, just underneath the floor level to connect with the glazed six-inch tile from bath and kitchen. How shall we connect? Can we use a T pipe or must we use one of the kind that is supposed to keep sewer gas from backing up? The man who is to do the work says the latter is not necessary and that the T pipe is the thing. I am afraid he doesn't know what he is talking about and I am anxious to have it right. I will appreciate very much any information you may give, as every one to whom I have talked don't seem to know. W. B. LAWRENCE.

In answer to the above inquiry we would say that common sense ought to tell the man that the odors from the catch basin having a free and unobstructed passage would fill the porous drain and would filter

up between the joints of the tile and into the basement. In case of back sewerage through the catch basin, due to stoppage in house sewer between catch basin and main sewer, or in case of main sewer becoming flooded and backing, the porous drain tile connection would afford a very convenient avenue of escape, and the sewerage would filter through the



porous tile and impregnate the soil, and foul the pipes. In the first place assuming that the main sewer drain of the house connects with the street sewer, the proper place to make the connection of the porous tile outlet to an outlet would be into the main house drain, as hereafter described. There is no particular reason for its being connected to the drain from kitchen sink and down spout pipes running to the catch basin. The proper way to sub-drain a building is to lay the porous drain outside of the foundation walls (generally speaking) and to run same into a cast-iron catch



basin inside of the walls. Cast iron, because it is water tight and a cover can be fitted to it making a water and gas tight basin, from this basin the outlet can be run directly into the main. If there is a possibility of back flow from main sewer the basin should be protected with a back water gate valve, such as shown and described in American Carpenter and Builder No. 5, Vol. 1. This valve will close against back flow. In many places this sub-drain basin is below the grade line of the sewer; in such cases the water is pumped from the basin into the main house drain (through a back water gate valve) by an automatic city water pressure driven lift or an automatic electrical pump, described in No. 12, Vol. I.

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It is easier to acquire a reputation for greatness than it is to keep it up.



Painting the New House

USE OF BEATEN GOLD OR OTHER METALS FOR DECORATION — PREPARATION OF GOLD LEAF SO IT CAN BE USED — BRONZING AND THE BEST METHOD OF DOING THE SAME

ONE of the most ancient of the arts, that are included within the painter's craft, is that of gilding, or overlaying a surface with thin sheets of beaten metal—be it gold, silver, aluminum, tin or some combination metal. The modern decorator uses gilding in many ways, either for accenting moldings or carvings, as in the colonial styles; for forming a background on walls, or for exterior ornamentation—as on the gilded domes of the Boston State House, or the State Capitol at Trenton, N. J. It is used for the ornamentation of railroad cars and wagons and extensively employed in sign work. In some classes of architecture, especially in church decoration, it is often found advisable to employ large surfaces of gold, for example as a background to pictorial decorations, but in domestic architecture, the pure metal, in large unbroken masses, is ordinarily too garish, or perhaps one might almost say barbaric, to suit the cultivated taste, unless it is modified in tone. The writer calls to mind, in this connection, a very effective use of gold in a small parlor, where the oak wainscoting and trim was gilded on the bare wood—that is to say, the wood had not been previously filled with a paste filler and leveled up, but the gold leaf was thoroughly worked into the grain of the wood by means of a soft brush used in the process of gilding. This gave a broken surface, the indentations of the grain of the wood causing minute shadows which modified the brilliancy of the metal and took away from its garishness. A similar use of gilding on oak or chestnut wood might be appropriate in an apartment where a very rich effect is desired and where handsome fabric hangings are used on the walls. In the Hotel Cadillac, at Detroit, the walls of the office are covered with gold leaf, which is modified in tone by being afterward covered with a thin glaze of asphaltum varnish, and in the cafe this treatment is still further modified by applying the gold leaf upon burlap and covering this background with a scrollage of grape vines. This is merely cited as another method that is used for modifying or toning down the brilliancy of the metal and permitting it to be

employed in large masses than it is ordinarily used. The famous "Vernis Martin" is gilding modified by asphaltum varnish.

Besides gilding with leaf metal, there is another method of coating a surface with metal, termed bronzing, because the metals usually employed are bronzes or alloys, although pure metal is sometimes employed. In this case the metal is used in a powdered form, and is made to adhere to the surface either by being first mixed with some suitable liquid or vehicle, and spread upon the surface in the same manner as paint, or else the surface is first coated either with paint or with a preparation known as size, and while the surface is still "tacky" or sticky, the bronze powder is dusted upon the surface, either by being blown on, or by means of a pad. Bronzes are more used than gilding, because the bronze is cheaper than gold, and the labor of applying it is much less. But, except where the bronze powder is made from pure gold, or aluminum, there is always a greater or less tendency to tarnish, whereas gold leaf is one of the most durable decorations known, perishing only by abrasion.

Gold Leaf

Although labor-saving machinery has been substituted for hand labor in the production of almost every other material used in building, or in the decorative arts, gold leaf is still made in the same manner in which it was produced in olden times, and nothing so far has been found to supersede the gold-beater's hammer. Other metals are reduced by means of rolls to sheets of comparative thinness, and gold can be rolled out by machinery to very thin sheets, but the thinnest sheet so produced is many times thicker than the gold leaf that is beaten out by hand with the hammer, for each sheet of gold leaf averages but one three-hundred thousandth part of an inch in thickness, and it requires 2,000 sheets of a size of three and one-quarter inches square to weigh one ounce. When it is considered that gold is money, and has a high intrinsic value apart from the labor which the gold leaf represents, and that one ounce of gold is worth twenty dollars, it will be

seen that the economy of labor in rolling out the metal into sheets by machinery would be much more than counterbalanced by the increased cost of the metal in the thicker sheets.

As pure gold is too soft to stand ordinary wear and tear, an alloy of gold and silver or gold and copper, such as is used in the manufacture of jewelry or for coinage, is usually employed in making gold leaf, except for special purposes, where the pure metal is necessary. The best commercial gold leaf is twenty-two carats fine, or in other words, twenty-two parts of pure gold are alloyed with two parts of harder metal. The color of the leaf varies with the proportion of copper or silver used, from almost silvery white to "red gold," although it requires but a small proportion of the alloyed metal to produce these variations.

The great advantage which gold leaf possesses over all other leaf metals, is that it will not tarnish, but will retain its original color and brightness, save as it may be affected by thin films of grime or dirt deposited upon its surface, and it is absolutely unaffected by any of the gases ordinarily contained in the atmosphere. When used for exterior decoration, it will in time be worn away by the beating of rain or snow upon it—a purely mechanical action, but this process is ordinarily a very slow one. When protected by varnish, as in the case of the gold letters on railway cars, the gilding will outlast several paintings of the surrounding surface and retain its original brilliancy, and old signs are often seen where the black background has become dim and gray from age, but the gold letters still remain perfect.

Gold leaf is sold in "books," each containing twenty-five sheets interleaved with paper, which is specially prepared to prevent the gold from adhering. For exterior work gold leaf is furnished closely pressed against white tissue paper, to which it firmly adheres. Upon being pressed against the sticky surface of the size, the paper can be pulled away from the gold leaf, which remains firmly adhering to the surface to be gilded. In this form the gold leaf can be freely handled in the open air without danger of being blown away. This is usually termed "patent gold leaf."

Gold leaf is made extra thick (from two to three times the usual thickness), for use on weather vanes, balls on flag poles, gilded domes, crosses on church steeples and similar locations where the surface undergoes peculiar exposure and where the work of regilding is attended with unusual difficulty and expense.

A special form of gold leaf is known as ribbon gold. This is thicker than the ordinary leaf and consequently more expensive. It is put up in long ribbons or strips of uniform width, rolled with a con-

tinuous strip of paper in a similar manner to rolls of silk ribbon. This gold is used for striping, and is applied by means of a small machine that is known as the gilding wheel. So far, ribbon gold has been made only by one manufacturer; the process being secret and carefully guarded and all efforts on the part of other manufacturers to imitate it have failed. Although the cost of the gold itself, per square inch of surface covered, is greater than with ordinary leaf gold, the economy of labor in applying it is so great that it more than counterbalances the extra cost of the metal.

Silver Leaf

Silver leaf is similar to gold leaf, but no other metal can be beaten out so thin as gold, the nearest approach being about three times the thickness. Hence other metal leaves can be handled more freely, and as the cost of the metal itself is much less, the item of waste in handling can be more or less disregarded. With gold leaf it is economy to arrange the work so that all the scraps of leaf may be gathered up, and when a sufficient amount accumulates, the metal can be sold.

Silver leaf tarnishes very readily, being affected by the sulphur gases in rooms lit by ordinary illuminating gas, or heated by coal fires, and is, therefore, very little used. Where the silver color is desired, its place is now usually supplied by aluminum leaf, which does not discolor under ordinary conditions; although its luster is slightly inferior and its color is grayer. Tin leaf more closely resembles silver than aluminum, but although it does not tarnish, it loses its luster and hence is little used, except for the purpose of giving a brilliant effect to semi-transparent colorings applied over it.

Dutch metal, the oldest substitute for gold leaf, is an alloy of copper and zinc. It tarnishes on exposure to the air unless protected by varnish or transparent lacquer.

Aluminum gold is an alloy of copper and aluminum, which is more permanent than any of the other gold substitutes, but for real permanency requires a protective coating of some kind. Another imitation of gold is an alloy of copper and tin, which stands about midway between the two foregoing.

Copper leaf turns a deep rich red or brown unless protected by lacquer or varnish.

Gilding With Gold Leaf

One of the greatest difficulties connected with the application of gold leaf is its tendency to stick to any moist surface. The workman dare not even touch the gold leaf with his hands when loose gold leaf is used, or the sheet will adhere to them and be ruined. The knives and other tools used in gilding must be kept very clean and perfectly dry, for the same reason.

The first thing necessary to do in gilding is to

coat the exact surface to which the leaf is to be applied, taking care to keep the outlines sharp, with a size of some kind, depending on the nature of the surface which is to be gilded.

The most usual size is known as oil gold size, or fat oil. This is made by allowing linseed oil to stand in an open jar until it becomes partially oxidized, from time to time carefully skimming off the thick skin which forms on its surface. It takes from six to twelve months before the oil is ready to use. Another oil size is made by boiling the oil. A quick-drying oil varnish, known as gold size japan, is also used. The advantage of this size is that it is ready for gilding in from ten minutes to a half hour after application, but it is by no means as durable and loses its elasticity. For this reason the oil gold size should always be used for outside work on wood or metal. In gilding upon these materials the surface should ordinarily be prepared by giving it several coats of paint, the last one being flat, and sandpapered perfectly smooth. A trifle of chrome yellow is usually mixed with the gold size in order that it may show more distinctly and to enable the painter to see that the surface is thoroughly covered and that the outlines are sharp and clean cut. Gilding can also be done upon varnish, the main thing being to have a smooth surface that is as nearly non-absorbent as possible and to which the gold size will adhere.

Gilding on glass, such as the signs on show windows, requires a special treatment. The gold leaf is applied on the inner side of the window, showing through the glass, and for this reason a perfectly clear size must be used. That which is usually employed is a very weak solution of the finest Russian isinglass in boiling water. Special sizes are also made for gilding picture frames and for other purposes.

For gilding lines or stripes, the ribbon gold is preferable to the leaf. The stripe is first carefully drawn with a special form of brush known as the "striping pencil." This requires a very expert workman, much practice being necessary to produce a straight stripe of uniform width. Within the past two or three months there has been put on the market a small striping wheel that mechanically feeds the color or gold size to a rubber and cloth disc, the width of which can be varied at pleasure. By using this striping wheel and ribbon gold on the gilding wheel, mechanically perfect gilded stripes can be produced in about one-tenth the time (or even less) that would be required by ordinary methods.

After the size has been applied to the space to be gilded, and has acquired the proper tack, the gold leaf is laid upon a cushion made by stretching roughly dressed calf skin leather over a wooden block, held in the left hand by leather straps. The leaf is laid

flat by means of the gilder's knife, and cut to the proper size, and is then deftly transferred by means of a special brush, called the "tip," to the sized surface. This tip is kept slightly oily by being frequently rubbed across the hair. The gilder is aided in this work by gently puffing the leaf with his breath, for it will be readily understood that a sheet of metal only one three-hundred-thousandth part of an inch in thickness is too delicate to be handled by the fingers, and even the puff of air must be of the very gentlest or the gold will be hopelessly crumpled. The sheets of leaf should project beyond the sized space about one-eighth of an inch, and each sheet should overlap its neighbor by the same distance, in order to make perfect joints. Where "patent" gold leaf is used, the leaf is taken up on the tissue paper to which it is attached, and carried to the sized surface by hand. Where considerable surfaces are to be covered with gold leaf, many gilders take the leaf directly from the book by means of the "tip," instead of first transferring it to the cushion. The gold, after being applied is dabbed down, and after it has been given sufficient time to firmly adhere to the size, the loose gold leaf that projects beyond the sized edges is then carefully dusted off, catching all the metal possible on a sheet of paper or something of the kind held below. If a shiny surface is desired, the gold is burnished, after allowing the gold size a sufficient time to harden. Gilding on glass is afterward "backed up" by a first coat of varnish or gold size japan, followed by a second coat of black japan. In the best gilding on glass, a second layer of gold leaf is usually applied over the first, so as absolutely to cover any defects in the under layer.

It will be seen that the process, which has been outlined above, of gilding with metal leaf, whether gold or baser metals be employed, is one requiring great skill, and is not one that can be undertaken by the amateur with any degree of success. Even the gilding wheel requires a skilled mechanic to handle it successfully.

Bronzing

The process of bronzing is almost as simple as that of painting, and any good painter ought to be able to make a satisfactory job of powder bronzing—or applying bronze powder to a previously sized surface—while even the amateur can use the bronze paints, many of which are sold in convenient cans for household use.

In powder bronzing, the surface to be bronzed is first painted and then is coated with gold size japan, and when this has arrived at the proper tack, the bronze is applied by means of a ball of cotton, or is gently blown on with a special form of bellows, such as is used for insect powder. It is then well polished with the cotton.

In bronze painting the bronze powder is mixed with some suitable vehicle, which varies with the particular kind of bronze used. For the aluminum bronze paint, so much used on ornamental ironwork, the so-called "banana liquid" is the best vehicle, but its odor is objectionable to many people, and moreover it is highly explosive, being a solution of gun cotton in amyl acetate. Hence it should not be used in the presence of any open light. It is quick drying, retains its elasticity under severe exposure and has no discoloring effect upon the bronze.

A good quality hard gum varnish, taking care to select one that will not diminish the luster of the bronze perceptibly, when thinned with turpentine or benzine to good flowing consistency, makes a suitable vehicle for any kind of bronze.

Prepared bronze paints are offered by a number of manufacturers, the vehicle generally being some special and secret preparation. They are either sold ready mixed, or the liquid and powder are sold separately to be mixed as wanted. Most of these are very satisfactory, but the range of colors is limited.

Bronze powders are not only made in the usual gold, copper and aluminum colors, but are also made in a large range of other colors, including reds, blues and greens, all of them having a brilliant metallic luster. To get their full effectiveness, these colored bronzes can be used only in the powdered form on a sized surface. They are particularly useful in ornamental stenciling, the design being stenciled with gold size japan, or with a colored paint made to dry "tacky."

Part Draperies Play in Decoration

IMPORTANCE OF SUITABLE DRAPERIES TO COMPLETE INTERIOR DECORATION—DRAPERIES WHICH HANG IN STRAIGHT FOLDS AND ARE HARMONIOUS WITH SURROUNDINGS ARE MOST ARTISTIC

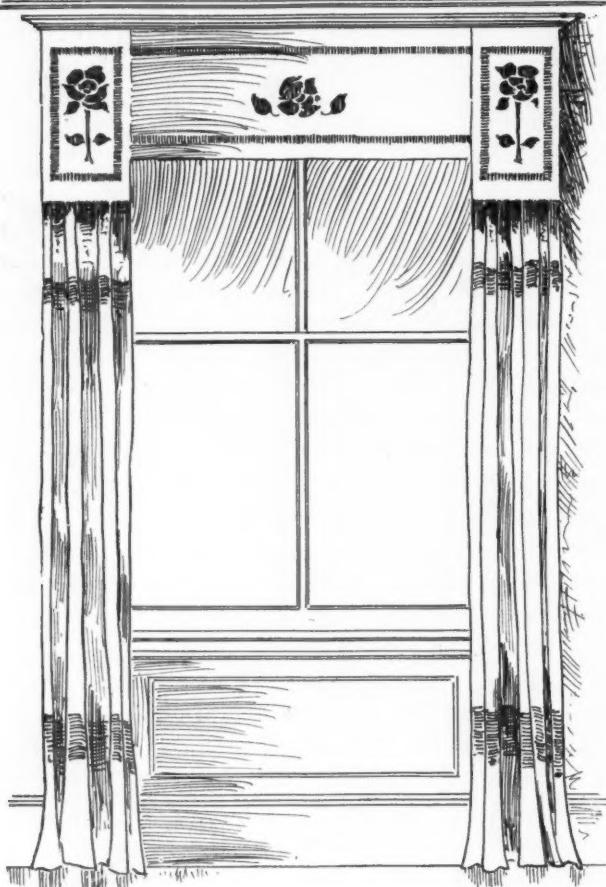
By Sidney Phillips

THE bare painting of the room and hanging the walls with paper or fabrics is not all of the decorative background that is necessary to bring out the real effectiveness of the room and to form an attractive dwelling place. The most up-to-date decorators include draperies as a part of their

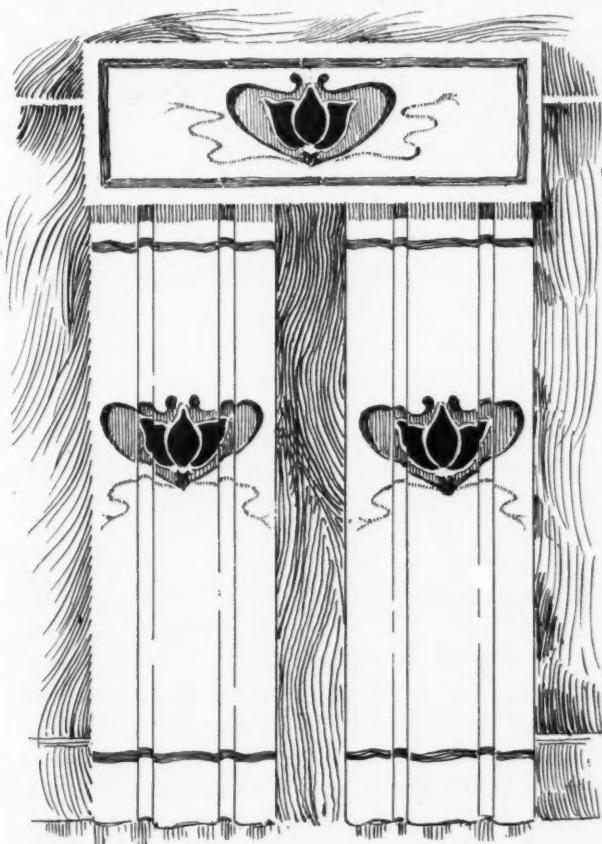
business, and it is eminently proper that they should do so, for nothing can more easily mar the harmony of a room than draperies which are incongruous either in color or style. Of recent years the wall paper manufacturers who cater to the high-class trade have many of them offered a line of cretonnes or chintzes in patterns and colorings to match some of their floral bed room papers, and these have been very generally acceptable to the trade as affording harmonious draperies for the windows and doors. Goods of this character are used, however, only for bed rooms.

The range of suitable artistic fabrics for the more formal apartments is very extensive, and includes fabrics of a great range in cost and quality. Soft finish burlaps and jutes form one extreme, while silk velours perhaps stand at the opposite end of the scale, although some of the silk tapestries are even more expensive. Light weight curtains of raw silk are effective and drape in graceful folds. They are specially useful for dining rooms, or for club rooms, and other apartments where smoking is permitted, because the odor of tobacco does not cling to them as much as it does to some of the heavier fabrics.

The most artistic draperies are undoubtedly those that hang in straight folds from a rod or curtain pole, and are simply pushed aside from the opening. If a material be used that hangs gracefully, nothing exceeds the simple dignity of drapery of this character. But it is not suited for all styles of architecture and decoration. For the Louis XV. and Louis XVI. styles, heavy cornices, from which the drapery is suspended, are more in keeping than the simple poles. But even in this case, straight folds



are more artistic than the looped back and draped curtains so much affected by the average upholsterer. Absurd drapery, fastened into fantastic shapes at the top of the opening and looped back on either side, is often seen in houses that make great pretense to expensive furnishings rather than to true artistic character. Such houses always look as though an upholsterer had been turned loose in them and told to do his worst, and he has done it. Fortunately, in the homes of refined and cultivated



people these draped portiers and curtains are being relegated to the limbo which has already swallowed up the once popular rope portieres and similar abominations. For the more formal apartments, where the simple rod is insufficient at the top of the drapery, the square valance, either with or without a cornice, or the panelled valance, as shown in the accompanying sketches, are simple and artistic, and can be decorated by embroidery, applique ornament, or by stenciling, to carry out any decorative style. The curtains are hung on rods, back of these valances, giving all the artistic value of the simplest forms of drapery, while the valance adds formality. Curtains of this kind, however, require heavy materials, such as velours. Fringes that were formerly so much used on draperies, have been largely abandoned. Indeed, simplicity is the rule that is followed by the best decorators. This is but one of the characteristics of the new art or the modern art that is making itself felt in all the decorative work of the day.

NEWS-ITEMS

The Ideal Concrete Machinery Company have established a plant at London, Ontario, Can., where they are now manufacturing the Ideal concrete block machine for their Canadian trade. This company have been manufacturing machines in Canada since August, and have found so great a demand for their product that they decided to take this important step.

E. R. Stowell, of New Corydon, Ind., who has been for some time engaged in the manufacture of so-called "refractory concrete," has given the exclusive agency for his composition to D. S. Roberts, of Fox Lake, Wis.

The Pettyjohn Company, of Terre Haute, Ind., has increased its capital stock to \$20,000. Laden Pettyjohn, the president, and William P. Pettyjohn, secretary and treasurer, also own the Terre Haute Pressed Brick Co., and the two businesses will be combined.

The Big Four road is laying concrete ditches along its right of way from Peoria east. Heavy rains formerly resulted in washouts along the line at this point and the company was determined to put in something that will stay, so concrete has been chosen.

Mr. E. B. Kelly, of the Contractors' Supply & Equipment Co., is now in England perfecting arrangements for supplying European trade with the Smith concrete mixers. He will visit Sweden, France, Russia and Hungary to complete his plans.

Mr. B. F. Shaw, general superintendent of the B. F. Goodrich Rubber Company, of Akron, Ohio, has awarded a contract to Frank B. Gilbreth, of New York, for a reinforced concrete factory building and warehouse. The building is about 75 feet by 125 feet, 5 stories and basement and is designed to carry a load of 500 pounds per square foot. The cost will be \$75,000. The Osborn Engineering Company, of Cleveland, Ohio, are the designing engineers.

Mr. Gilbreth has also been awarded a contract for a 60x60-foot two-story reinforced concrete building, to be used for manufacturing purposes, by the Stayman Manufacturing Company, of Jersey City, N. J. This is the second contract which Mr. Gilbreth has received from this concern this year.



Some men seem to think that advertising comes out of the profits; not a bit of it—the profits come out of the advertising.



Something the Boys Can Make

KIND OF MATERIAL TO USE AND METHOD OF MAKING BOOK SHELVES—PROPER DIMENSIONS OF ONE FOR ORDINARY USE

EVERY boy possesses a few good books. The book shelves, the description of which follows, will be found an excellent place in which to keep them.

The principal joint used is the keyed tenon. All

stock is one-half an inch in thickness, and a board twelve feet in length by six and one-fourth, or more, inches in width is needed.

It will be well to get stock which has had its two surfaces well planed to the required thickness.

Saw this board into six lengths. Three of them so that they may be squared to six inches by twenty-two inches; two of them so that they may be squared to six inches by twenty-four inches; and one of them to a width of six inches and a length of nineteen and one-half inches.

Square up the first five of these pieces in the usual way to the dimensions just given. The last piece may be squared for joint edge and on two ends, the second edge need not be planed, as the irregular curve cuts it off entirely.

The stock from which to get the keys is of the same thickness as that of the sides and shelves and, since they are so small, can probably be got from the twelve-foot board after the other pieces have been cut. Plane and scrape all surfaces nice and smooth.

The tops and bottoms of the side pieces may be varied from the square ends such as are shown in the photograph if desired. Various designs will suggest themselves. Whatever design is chosen let it be simple. The square ends have been found to work out nicely and are easily made.

To lay out the mortises in the side pieces, Fig. 1, place them side by side with their edges upward and their ends evened. While in this position fasten them in the vise or clamp them together that both hands may be free to do the measuring.

Begin at one end and, with the rule and a sharp pencil, mark off consecutively the following points: Two and one-half inches, one-half an inch, nine inches, one-half an inch, eight inches and one-half an inch. There should remain three inches from the last point laid off to the end of the piece. At these points square lines across the upturned edges of the two pieces.

Now, remove the pieces from the vise and, with a trysquare long enough to have its blade reach across the board, square sharp pencil lines across the surfaces to correspond with the lines just squared across on the edges. This work must be done very accurately, care being taken to keep the beam of the trysquare always against the joint-edge.

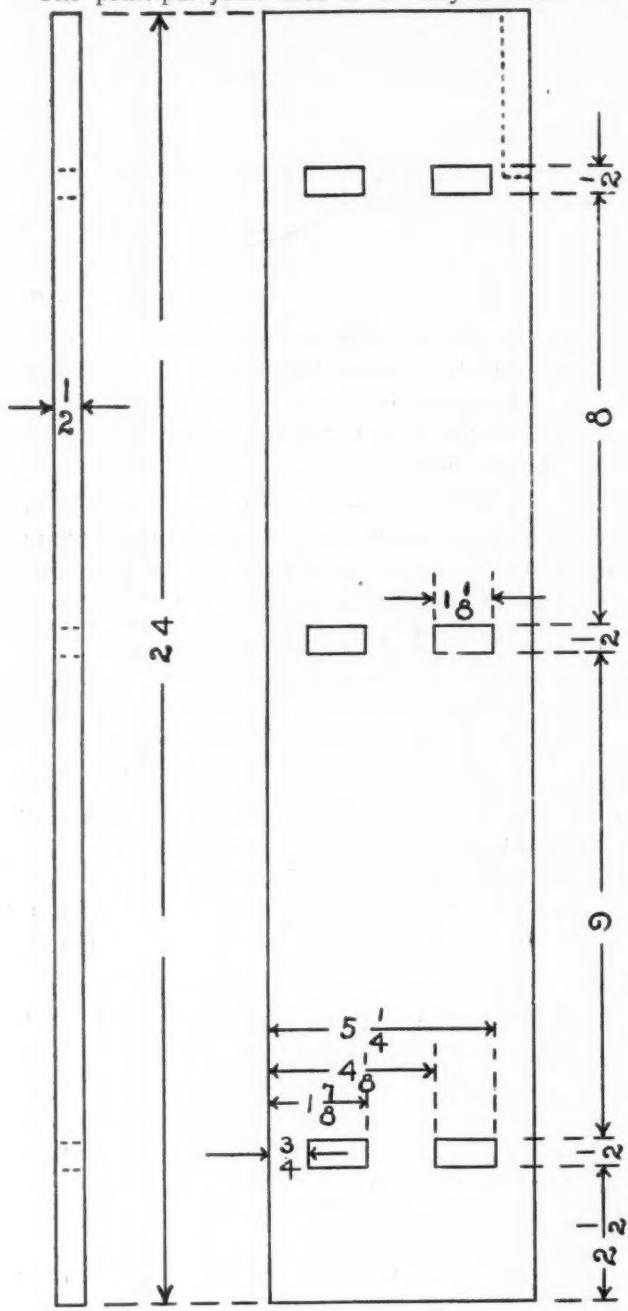


FIG. 1.

Set the gauge to three-fourths of an inch and gauge between the pencil lines which were laid off one-half an inch apart.

Get in the habit of doing all the work which can be done with one setting of a tool. In gauging, for instance, there will be three places on each leg, six places altogether, which can be marked with one setting of the gauge.

Set the gauge to one and seven-eighths inches and

Set the gauge to one-half an inch and gauge from what is to be the back edge, upon what is to be the inner surface of each leg, gauging from the point at which the middle of the top shelf will be when in position, Fig. 1, to the top of the leg.

Again, set the gauge to three-sixteenths of an inch and gauge the same length of line upon the back edge, gauging from the inner surface, from the middle of the position of the top shelf to the top of the leg.

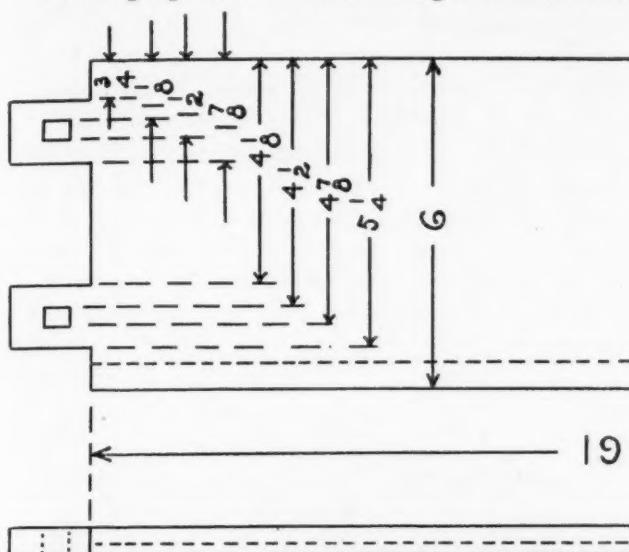


FIG. 2.

gauge as before. This lays out the sides of the mortises along the joint edge, the gauge block having been held against the joint-edge.

To lay out the shelves, Fig. 2, even the ends of all of them after placing them together with their edges upward. While in this position measure from one end one and one-half inches and mark, then nineteen inches and mark. There should remain one and one-half

It will be observed that the dimensions just given require that all the gauging be done from one edge, the joint-edge. It might seem at first as if time could have been saved by gauging from each of the two edges instead of one, as the gauge would then require but half the resetting. The same is true of the gauging for the tenons, Fig. 2. The reason for the directions just given is that any variation in the width of the pieces will not affect the fitting of the tenons into the mortises. If the gauging should be done from each side, the mortises and tenons, though they would be of the proper size, might not fit at all because of some variation in the width of one, or both pieces.

These mortises may be made by selecting an auger bit somewhat less in diameter than the width of the mortise and boring as many holes as possible without cutting the boundary. Finish with the chisel, beginning in the middle and working out towards the line. Cut from one side half way through, then turn the piece over and finish from the other side.

There should be a rabbet cut in each leg at the top in such a manner that when the shelves are put in position the legs will pair.

The description of the manner of cutting this rabbet will be found in the July, 1906, number of this journal, in this department.

To lay out the shelves, Fig. 2, even the ends of all of them after placing them together with their edges upward. While in this position measure from one end one and one-half inches and mark, then nineteen inches and mark. There should remain one and one-half

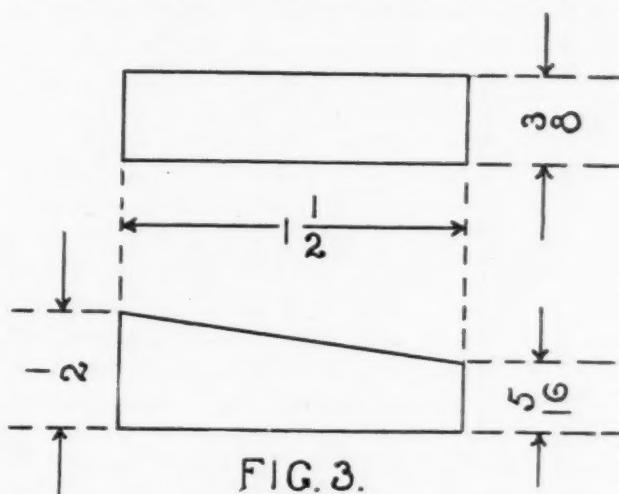


FIG. 3.

inches to the ends of the pieces. Square lines across at these points.

Separate the pieces and carefully square sharp pencil lines across the surfaces to correspond with the lines squared across the edges, keeping the beam of the try-square against the joint-edge in doing so.

Now set the gauge to three-quarters of an inch and,

keeping the gauge block against the joint-edge gauge at each end, on each side of the piece, and on the ends as well. Set the gauge to one and seven-eighths inches and repeat. This lays out the tenons next the joint-edge. For the remaining tenons set the gauge first to four and one-eighth inches, then to five and one-quarter inches and gauge as above.

It will be well to lay out the mortises for the keys before cutting out the tenons.

From the lines which mark the shoulders of the ten-

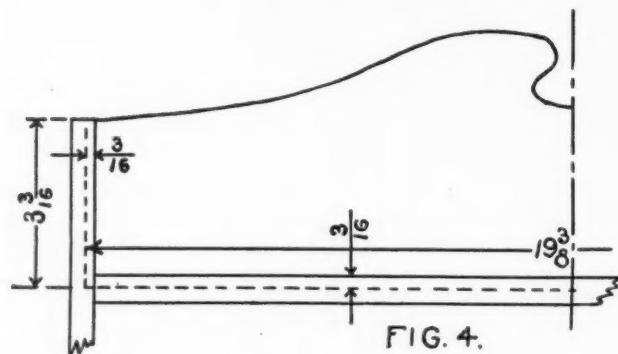


FIG. 4.

ons measure three-eighths of an inch towards each end respectively. From these points measure one-half an inch towards the ends. Square sharp pencil lines through these points, the beam of the trysquare resting against the joint-edge. These lines need not be carried entirely across the piece, just across the tenons.

Set the gauge to one and one-eighth inches and gauge each surface at each end, gauging between the pencil marks just drawn. Again, set the gauge to one and one-half inches and gauge as before. Now, set the gauge to four and one-half inches and, still keeping the gauge block against the joint-edge, mark the remaining tenons. Finish by setting the gauge to four and seven-eighths inches. These mortises may be bored and cut as were those in the side pieces.

Cut the tenons with the saw, the shoulder between the tenons being cut with the turning saw and trimmed to the line with the chisel.

The top shelf has a rabbet cut on the upper surface and back edge. Set the gauge to three-sixteenths of an inch and, with the gauge block against the upper surface, gauge a line on the back edge the entire length of the board. Again, set the gauge to one-half an inch and with the gauge block against the back edge gauge a line on the upper surface the entire length of the piece.

The manner of cutting this rabbet is the same as that to which reference has previously been made. The dotted lines, Fig. 2, indicate this rabbet. It is cut in the upper shelf only.

The keys, Fig. 3, are cut from one-half inch stock. A joint edge is obtained and one end squared. The length, one and one-half inches, is marked from this end and the second end squared. Measure from the joint-edge at one end one-half an inch, at the other five-sixteenths of an inch and connect these points

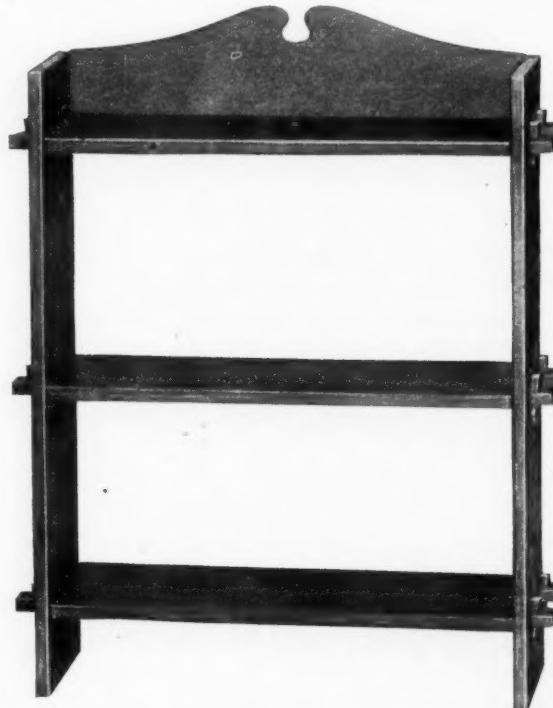
with a straight line. This line gives the slope for the remaining edge. Twelve keys will be needed.

Another way, if the stock is in shape to allow it, is to joint up two edges, then lay out all the keys at once in such a way that the cut of the slope on one key will make the slope for another. Of course, room for the saw cut must be allowed in the laying off.

The board for the back, Fig. 4, should have an edge jointed and its ends squared. It should be nineteen and three-eighths inches long. At the ends it must be three and three-sixteenths inches wide. The rest of the width will be determined by the design used.

For a free hand design, Fig. 4, make one-half free hand, fold on the center line and trace the second half getting the parts alike. Make the drawing full size. Place the completed design upon the wood, using carbon paper. Cut the design with the turning saw and smooth with scraper, spokeshave and file.

A good modification of the structural design of the shelves would be to put the middle shelf in with a gain instead of keyed tenons. A description of



how to make a gain will be found in the September, 1906, number of this journal.

The finish to be applied will depend upon the kind of wood used. Interesting description of various finishes or ways of finishing wood can be found by reading the back numbers of the AMERICAN CARPENTER AND BUILDER under the heading of Painting.

Competitors, like adversity, are useful—they force us to be industrious, and industry is the greatest developer of capability.

When you dispute with a fool, you may be sure that he is similarly employed.



Cutting Siding for a Gable

To the Editor:

Equality, Ill.

How many of you ever tried cutting the siding for a gable on the ground, instead of on the tresses? The idea is original with me as far as I know as I never saw anyone else use it. It is much easier, quicker, more saving of siding and much more satisfactory every way than to cut it out on the scaffold. As soon as you are well onto the gable fit in a piece to run clear across the gable if possible. Now be sure and cut this piece to fit neatly as it is your pattern. Now take this to your tresses and with your working gauge lay off what you want to show to the weather. Gauge all your timber for the gable this way. Now lay the piece already cut on the next piece to be cut with the gauge line at the bottom of the piece to be cut just as it will appear when put up and mark the length. Now lay your pattern on top of the piece to be cut and mark your angles same as pattern. Don't use your bevel square, for if the siding is not exactly straight your bevels will be wrong. Now proceed in like manner, until all are cut; then all you need to take to the scaffold is your hammer and block-plane, and you will not need your block-plane if you have been careful to cut the angles like the pattern, and you have no nails to set to hold your siding while you mark it.

J. H. GODFREY.

Testing Cement Blocks

To the Editor:

Moundridge, Kans.

How can a man test cement blocks at home without a special hydraulic press, or is there no way of doing this at all?

THEO. KREHRIEL.

Answer: Hydraulic presses, while determining the exact number of pounds required to crush a block, do not give same results as a plain test made by the same workmen who build your buildings. To do this, build a concrete floor 3 feet wide, 5 feet long on a firm foundation 2 feet deep made of concrete and tied together with steel rods, both crosswise and lengthwise. When this is sixty days old you are ready for testing, which is done by placing the block to be crushed upon it or for wall test, two blocks one upon the other, properly united with mortar thirty days old. Cap the block with a steel plate at least 1 inch larger than the block and not less than 1 inch thick. This plate must be bedded with neat cement, and when two days more have elapsed, build a platform upon it 2 feet wide and 12 feet long. This platform is usually made of four oak timbers 2 inches by 12 inches by 12 feet, set at 4-inch centers, and piers built under each end within 4 inches of their lower side to prevent tipping.

This platform is uniformly loaded with blocks until the test block crushes. In using this method, I desire blocks for loading that average one hundred pounds each, thus

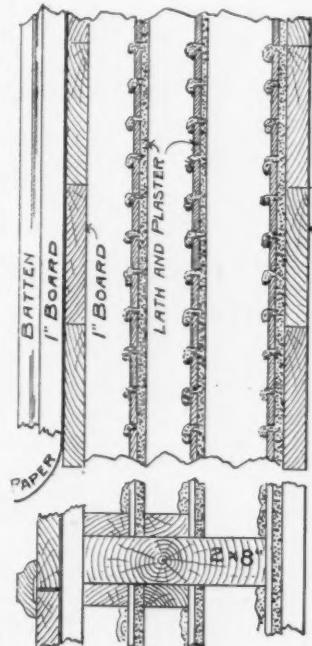
twenty blocks equal one ton, and it is quite frequent that blocks 8 inches high with a bearing surface 8 inches by 24 inches, of which one-third is air space and the balance (1 square foot) solid concrete, will require a load of 1,600 to 1,700 of those blocks to crush it and a load of this size requires a second plank platform 4 feet by 16 feet, which is usually placed two or three block courses above the first. To make 4-inch cubes and test in the manner above described is far cheaper and equally as satisfactory. EDITOR.

A Non-Freezing Potato House

To the Editor:

Grand Rapids, Mich.

I am called upon to make a plan of a potato warehouse in which lumber will be the main material, and, of course, it must be frost proof as much as possible. I have thought of making walls like accompanying pencil sketch. The studs will be 2 by 8 set on 16-inch centers. On the outside are first placed one-inch boards horizontally with the studs, and over this are one-inch boards placed perpendicularly, with building paper between them, and the cracks are covered with buttons. There will be two courses of back plaster as shown, making three dead air spaces in the width of the wall. The inside of the wall is lathed and plastered, and over this boards are placed for the protection of the plastered walls. Would the editor give his opinion about this way of construction? The main object is to keep the frost out. HARRY VELDSMA.



Answer: We herewith produce Mr. Veldsma's sketch. The plan is all right, provided all parts of the building are constructed accordingly tight. The three dead air spaces will act as a non-conductor of frost sufficiently to protect the interior from freezing in most sections of the country where potatoes are raised. However, we would suggest putting two or three thicknesses of paper between the outer boards. Would use tarred felt for the last layer. EDITOR.

Looking After Little Things

To the Editor:

Witt, Ill.

I quite agree with you that it is the little things that

often escape our notice, and yet it is the little things that count, and that cause so many jobs to be profit or a loss, just in accordance to the way we look after them. The man who looks after the little things in any calling is the successful man, and especially is this true of the carpenter trade. It should be our aim to look closely after all the minor details of a job and learn to do our work in the way that requires the least labor, not that I am afraid of work do I make such a statement as this, but who has not been around where carpenters were at work without noticing the amount of work that is being done that does not advance the job at all, but is the result of dragging along in the same old rut and not learning the latest methods of doing things. I have noticed that it is the general rule with carpenters here to rabbet frieze lumber to receive the siding, and when asked why they did so frankly confess that they know of no other method. My way of getting around this disagreeable task is to take common lath and cut them in lengths about two inches shorter than the frieze board is wide. These I nail to the sheathing all around the house, placing them directly over each studding, where the frieze is to be nailed and when the frieze is placed over these it will project over the strips and allow the siding to slip up under just the same as if the old method has been followed, beside you can use seventh-eighths inch lumber for the frieze and when the job is done it will have all the appearance of one and one-quarter inch stuff having been used, so it will be seen that this method saves material as well as a great amount of hard labor. I mention this as one of the little things of which there are many, and right here is where the American Carpenter and Builder is doing a great work for us. It is the medium through which we can exchange our good ideas with our fellow workmen and have a knowledge of what all who are engaged in this great trade are doing. I have been so interested in reading the good things that others have offered that it had not occurred to me to say anything, but if this is of any benefit to any one my efforts will not have been in vain.

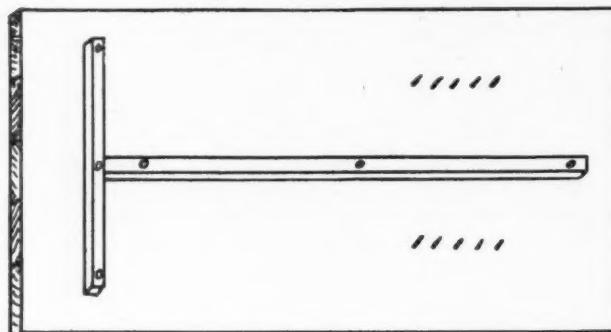
E. H. RANSDELL.

Sash Pulley Gauge and Marker

To the Editor:

Pittsfield, Ill.

I am sending to you a drawing of a sash-pulley gauge and marker, such as I use. I don't say it is the best used, but I do say there is no better. Take a piece seven-eighths by six inches wide and eight inches long. Then take a piece of parting stop one-fourth by one-half inches, nail on as shown in drawing the piece running



MARKER FOR SASH PULLEYS

lengthwise drops in groove in jamb which is plowed for parting stop. The piece running crosswise rests in the gain which is made for the header. The dots represent

brads which come up about one-eighth of an inch and are filed sharp. When you drop it in place give it a tap with the hammer and the brads do the rest. Both pulleys are marked at once. Set the point of the bit where the brads marked and your pulleys will fit as if they had grown there. Of course different makes of pulleys need different kind of markers. I have two and I always make it a point to get pulleys to fit one of them. I have seen some pretty poor jobs of this kind and it is unnecessary. Different people have different ways and I would like to hear from some of the other readers on the subject.

BEN JOHNSON.

Finishing Porch Floors

To the Editor:

Paintsville, Ky.

I have a veranda floor of Southern pine and want to finish it natural. It is on the side most exposed to the sun and rain. Will you please tell me how to finish it?

FRED W. CASTLE

Answer: The first essential for finishing a porch or veranda floor so that the finish shall be reasonably permanent is to protect it from dampness that rises from beneath. To do this, it is necessary that the under sides of the floor boards should be thoroughly painted before being laid, with a heavy coat of rough paint. Any odds and ends will answer, or the mineral brown used for painting freight cars, barns and tin roofs makes an excellent paint for this purpose. A second coat of paint, after the floor boards have been laid, should also be given if there is space enough under the floor to permit of doing this. It is also advisable to lay the joints in white lead; using the ordinary pure white lead in oil, made enough thinner with pure linseed oil to permit it being pushed into the grooves of the boards with a putty knife before the boards are driven together.

If the floor is to be painted, it should be given three coats of paint, at least. The priming and second coats should preferably be pure white lead, thinned with linseed oil and turpentine, and well brushed into the wood. All cracks must be thoroughly filled with pure whiting and linseed oil putty after the first coat. The floor must be thoroughly cleaned before priming and all mud, plaster, grease or other dirt entirely removed. The surface must be thoroughly dry, and no painting should be done immediately after a frost, heavy dew or rain. The third coat may be more oily than the undercoats. Good work cannot be done with less than three coats; four are better. The last coat of paint must be brushed out smoothly and evenly so as not to leave heavy places which will dry unevenly and soon wear out.

A natural finish for a porch floor is much more difficult to make satisfactory. There is an almost unavoidable tendency to darken, especially on yellow or Southern pine. The same precaution should be taken in regard to protecting the floor from underneath as if it were to be painted. After the boards have been thoroughly cleaned they should be filled with a good paste filler (silex), applied to five or six boards, at a time allowed to set, but not to get hard, and then rubbed well into the grain of the wood, rubbing across the grain, with burlap. Any excess of filler must be wiped off with a soft rag. Many painters regard the use of paste filler on yellow pine as absurd, but it gives a solid foundation for a floor that cannot be obtained in any other way. A porch floor is obliged to stand wear and tear and exposure to the weather and for this reason the ordinary floor varnish is unsatisfactory. Three or four coats of the best exterior varnish or spar coating should be used, allowing not less than four days between coats, and if possible, at least a week should be allowed after the last coat is applied before the floor is walked upon. When the floor becomes scratched its luster can be restored by rubbing with crude oil or an oil polish.

EDWARD HURST BROWN.

PRACTICAL TRADE APPLIANCES

A New Shingle Stain

A new waterproof and odorless shingle stain of entirely different make-up from any other shingle stain is being placed for sale upon the market. This stain is supposed to contain the most protective liquids and the very best quality of coloring matter that is possible to be made. These shingle stains are represented by the manufacturer to be absolutely free from creosote, and do not contain that disagreeable odor so common to shingle stains. It is claimed by the manufacturer they are much more pleasant to use and can be applied in fully one-third less time than other shingle stain. The great trouble with most shingle stains are they allow the shingle to take in water and become wet and it is well known there is no greater enemy to the life of wood than dampness. The manufacturers of this new odorless and waterproof shingle stain will send you a catalogue telling you all about the durability and giving you full information if you are further interested. They are Parker, Preston & Co., Norwich, Conn.

Cement Brick Machine

We have recently received three varieties of some brick molded upon the Sodestrom Cement Brick Machine. One of these bricks was made of one-third each of mar-

not disintegrated in any way which proves that bricks made on this machine with the proper mixture will make a splendid building material in that they have withstood the various tests of weather conditions and rough usage. Further particulars with regard to this machine can be secured by writing J. A. Sodestrom, Sac City, Iowa, and mentioning the American Carpenter and Builder.

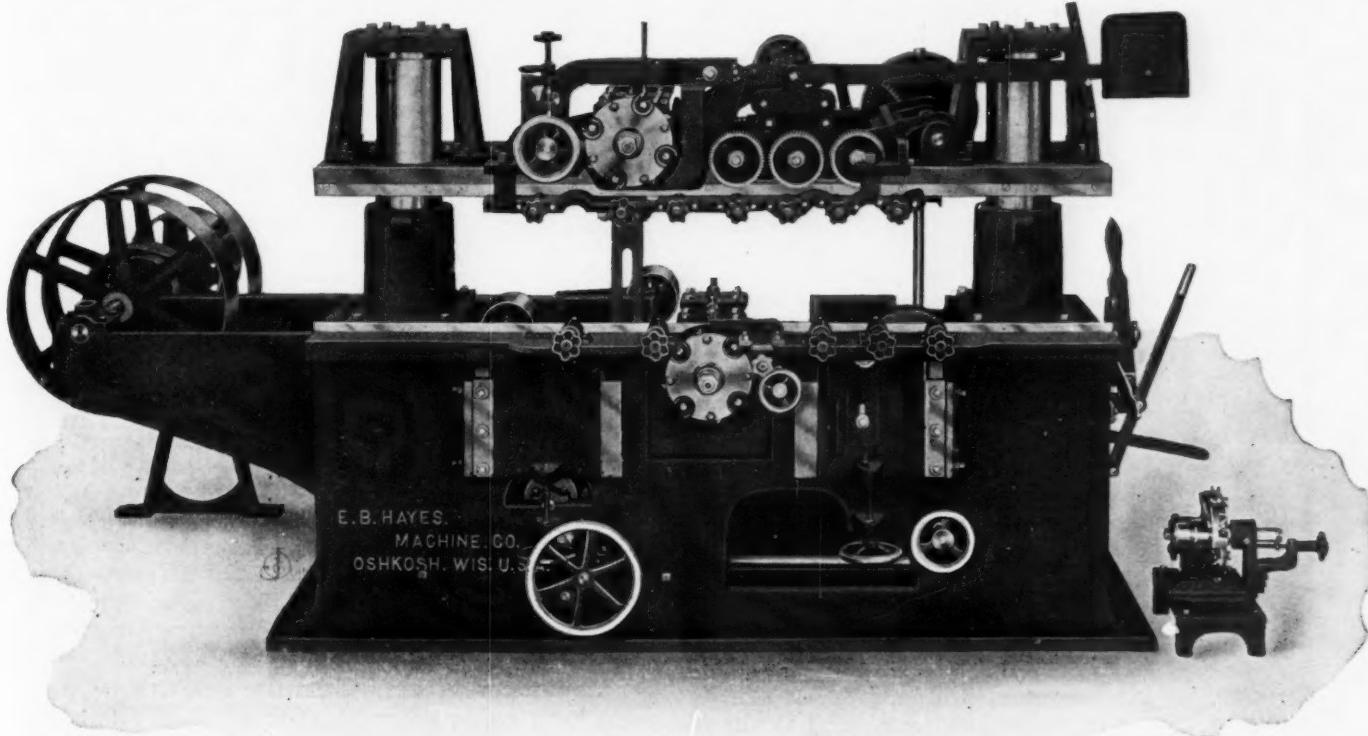
An Improved Door Sticker

In looking over the illustrations as well as descriptive matter sent to us recently by the Hayes Machine Co. we note that they are offering a new tool to the trade, which we feel sure will arouse much interest among door manufacturers throughout the country.

It may be rather difficult for this class of woodworkers to conceive of a door sticker that will stick stock at the rate of 60 or more feet per minute and at the same time accomplish its work in a highly acceptable manner, however this feat is unhesitatingly claimed by the makers and their claim is substantiated by many actual users of this tool.

A glance at the accompanying cut gives a very good idea as to the construction of this machine, and it will also impress the reader with its massiveness and general excellence of design.

The machine is designed to work stock up to 24 inches in width, adjustments for different widths being made by chang-



ble dust sand and cement, while the other two were made of a mixture of 1-4. While shipped from a great distance they have retained their sharp edges and have

ing the position of the top rather than the position of the lower bed, as is the case in all other tools of this kind. This novel method meets with the hearty approval of the operator

as in having the bottom bed stationary it makes it conveniently accessible to him at all times when feeding the machine. The raising and lowering of this bed is accomplished entirely by means of power.

This sticker has a variable feed ranging from 10 to 75 feet per minute, the various rates being instantly obtainable by the operator while the machine is in full operation. While this machine is particularly well adapted for the veneered door manufacturers, it is being received with equal enthusiasm by the soft wood door people as well. Cuts and detailed information will be gladly furnished to those who are interested by the Hayes Machine Co. of Oshkosh.

Metalsteel Paint

We notice in this issue of the AMERICAN CARPENTER AND BUILDER the advertisement of the St. Louis Surfacer & Paint Company, located at the corners of Commercial, Walnut and Levee, St. Louis, Mo. Through the courtesy of Mr. Avis, the representative of the paper was shown from top to bottom of the six story building occupied by the company. This company are manufacturers of high grade "Paint Specialties," and among other things make the steel protective paint known as "Metalsteel" Paint, which is being specified and being used by architects and construction companies all over the country. Their "Metalsteel" Paint has won for itself a high standing as a protective coating for structural steel, steel roofing, fire escapes, etc., and in fact any exposed metal work.

The Hoosier Building Block Machine

The Hoosier ideal face-down building block machine, made by the Hoosier Manufacturing Co. of Auburn, Ind., is built of the best gray iron and polished cold-rolled steel. Each part is machined to a perfect fit. All parts are numbered and in case of accident or breakage parts can be ordered by number and guaranteed to fit, thus avoiding mistakes frequently met with in ordering parts for machines not numbered. The machine is furnished with iron pallets which will last as long as the machine. They will not check or warp and don't have to be replaced, as wood pallets do, which require from two to three sets a year. This is a very important item.

The machine is furnished complete with all the accessories for doing first-class work in rock, panel, plain, circle and angle blocks. The capacity of the Hoosier, two men, ten hours, is 200 perfect blocks, 8x8x16 inches. This is guaranteed by the company. The construction of the Hoosier is such as to admit of a wide range of practical work. It is easily moved from place to place by two men. It has advantages over many other machines in forming the face of the block in the bottom of the mould, thus tamping directly upon the face, giving every impression of the design, using a finer and stronger material for the face of the block and coarser material for the back. This method enables the operator to get the effect of cut stone.

The simplicity of the Hoosier is its strongest feature. It has no cogs, springs, chains, pulleys or segments. It is a common-sense machine built for common-sense people.

Brayton Standards

This book is a complete work on concrete reinforcements, showing methods which have been put into practice and found highly efficient and economical. Complete designs are given showing the details of beam and column reinforcement, stair construction and reinforced column footing. It is a valuable book for architects and engineers. Louis F. Brayton, C. E., Minneapolis, Minn., is the author.

New Books

A book which will be of great value to every one interested in architectural hard wood finishing has been published by

the Painters' Magazine of New York, called Architectural Hardwood Finishing, edited by Geo. Whigelt. It dwells upon various kinds of woods used and hard wood finishing and their preparation. Stains, wood fillers, paste fillers, varnishing and other methods of finishing wood work are treated very completely. The treatment of the subject throughout the book is clear and concise and is filled with much practical and useful information.

A book on how to make violins and other string instruments by Paul M. Hasluck, is being published by David McKay, publishers, of Philadelphia.

A New Money-Maker for Dealers

It is not very often that a real, brand new proposition comes along and for this reason we believe the readers of this paper will be unusually interested in the advertisement of the H. M. Sheer Co., of Quincy, Ill.

When this company applied to us for space in our paper, their proposition was so different to our regular line of advertisers that we were more than ordinarily interested to learn how they had built up such a remarkable business. So we investigated and the more we

looked into the matter the more we were surprised that their idea had not been put before the hardware dealers before.

But, as is so often the case with good opportunities, it has been overlooked until the Sheer Co. in looking for new worlds to conquer hit upon the idea that their proposition was specially suitable to the builder's trade in many respects.

For eighteen years this company have been manufacturing incubator and brooder fixtures, and have through judicious advertising and high classed goods built up a very successful business. Last year they interested over eighteen thousand people in their line of goods. Any one familiar with the magnitude of the poultry industry, which by the way exceeds in volume more than any single industry of the day, not excepting iron, steel, wheat, or manufactures, will readily realize here is a field that has no limit of possibilities in way of trade.

We might have gone into detail and given you more explanation of their plan, but we do not feel that we can present the proposition as well as the originators. For that reason we urge you to write direct to this company. We assure you at the start you will find them dependable in everything they say and offer. They have a good thing and the wide-awake man will "make hay while the sun shines," by getting in touch with them at once.

The season for their goods is just coming on, and there is no time to be lost if you wish to get the benefit of it this season.

A "Complete" Concrete Catalogue

A complete catalogue on concrete is one which contains everything which the user of concrete could desire to know. Such a catalogue has just been issued by the Miracle Pressed Stone Co., of Minneapolis, Minn. Beside exhaustive descriptions and illustrations of the multitude of machines and tools manufactured by this company, it





The Roofing Tin Experience of a Firm of Kansas Merchants

"Target and Arrow Old Style" tin still giving good service after many years' wear, while a cheap imitation "old style" gave out in a few years' time.

This building of M. E. Yost & Sons, of Hiawatha, Kansas, was built in two parts. One part was roofed with genuine "Target and Arrow Old Style" tin and the other with an imitation "old style." The "Target and Arrow Old Style" tin has given splendid service for many years without costing a dollar for repairs, while the so-called "old style" has been a constant trouble and expense.

Messrs. Yost & Sons are now building a cement block building of three stories and basement, and the builder has bought "Target and Arrow Old Style" tin for the roof.

The experience of Messrs. Yost & Sons with tins which are called "old style" for the purpose of trading on the reputation of the genuine "Target and Arrow Old Style" tin is being duplicated all over the country. Our booklet, "A Guide to Good Roofs," has kept many out of expensive mistakes of this kind. Would you like to read it?



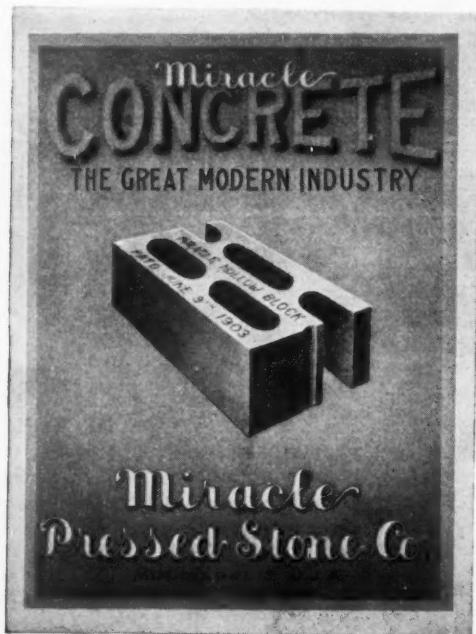
Note that we now use the old name for the brand—"Target and Arrow Old Style"—rather than the words "Taylor Old Style," which have been imitated in every possible way by other tinplate houses.

N. & G. TAYLOR COMPANY

ESTABLISHED 1810

Philadelphia

contains some excellent advice on entering the field as a manufacturer of concrete blocks, showing how it can be done with small capital, and illustrates the profits which may be expected. It also contains complete instructions



in every detail on the manufacture of the blocks, together with the standard specifications adopted by the National Association of Concrete Machinery Manufacturers, and approved by cement users' associations. The Miracle people are charging 25 cents for this catalogue of 114 pages and cover, and it is well worth the price.

Waterloo Brick & Block Machines

Attention is called to the Waterloo concrete brick and block machine illustrated herewith. This machine is entirely operated with one movement of the lever through an angle of 90 degrees. It is so balanced that the weight of the binding frame will open the molds as soon as the catch on the lever is released; no jerks or jar to damage the newly-made block.

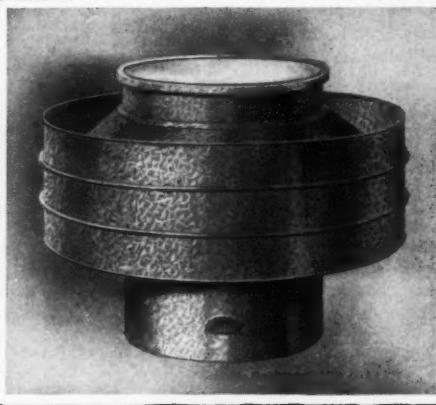
The machine is free from all gears and chain which clog with concrete and cause a vibration while being operated, crack and crumble the blocks, causing damage and loss of labor and material. Instead of gears and chain is used a cam to raise and lower the binding frame and a shaft-arm to insert and withdraw the cores. These cannot clog or break. They work on rollers, so are practically ball-bearing.

The binding frame positively prevents the molds from being tamped open, tamp as hard as you wish. As the lever is lowered, the binding frame drops down and the molds are drawn outward from the block.

The molds are hinged below the lower edge and are drawn from the block, beginning at the top, avoiding all suction in releasing the block. This leaves the face of the block in perfect condition.

The cores are slightly tapered and are withdrawn two inches and entirely free from the block before the side molds are moved. The cores are bolted on two shafts, which run through two bearings each, forcing them to run perfectly true. The block cannot be cracked in withdrawing the cores. The block is patented, has the "V" binder and both a vertical and horizontal air space.

The fireproof character of this block is indicated by a recent experience in Waterloo, Iowa. A large frame barn adjoining the Waterloo concrete-block building was afire and the fire became so hot that the roof of galvanized iron was



This is the Only Ventilator

that has a sliding sleeve damper (patented); the **only** ventilator that may be closed without obstructing the light; the **only** ventilator that will not collect dust on the damper when closed; the **only** ventilator that is absolutely storm proof. These advantages are secured by a special patented design; and this design is carried out under such a careful system of manufacture that it makes

The Burt Ventilator

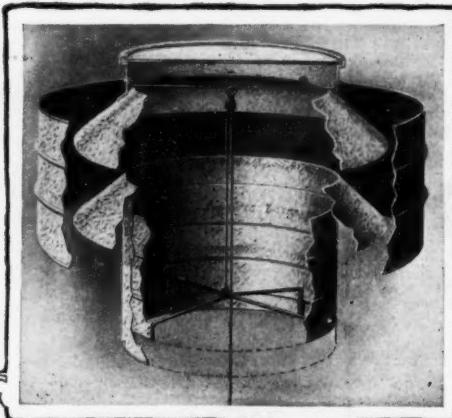
the best investment, as it is the **best ventilator** of any similar device on the market. No other original ventilator is so well designed; no successful imitation of the Burt has ever been made.

The Burt is the cheapest as well as the best to buy because its great pulling power (greater than any other stationary ventilator) gives the same ventilation with a smaller number of ventilators. Made in all sizes, and furnished with either glass or metal tops as preferred.

Write for our 64-page General Catalogue which explains all of the special Burt features in detail.

**The Burt Mfg. Co.,
500 Main Street. Akron, Ohio.**

Largest Manufacturers of Oil Filters and Exhaust Heads in the World. Agencies in nearly all the principal cities of the World.



Here

Mr. Carpenter

This 25-cent Book Is
FREE



It tells all about finishing, refinishing and polishing wood. Full of practical ideas of great value to carpenters and wood-finishers.

Write For It

Send us your name and address today for our new book "**The Proper Treatment for Floors, Woodwork and Furniture.**"

It is illustrated from life and printed in six colors—size 5 x 8½ inches—48 pages. It is the most elaborate and practical book of its kind ever printed. The regular price is 25 cts., but for limited time we will send it free as above.

Johnson's Prepared Wax

"A Complete Finish and Polish for All Wood"

For Floors, Woodwork and Furniture

It produces a lasting and artistic finish to which dust and dirt will not adhere. It does not crack, blister, peel off or show laps. Heel marks and scratches will not show.

Johnson's Polishing Mitt

the back and slips on hand. It is far ahead of cloth, brushes or anything for similar use, and will last for years. Sent FREE for name of your paint dealer. Use coupon below.

Johnson's Prepared Wax is sold by all dealers in paint — Universal size, 1½ oz., 10c; Household size, 4 oz., 25c; 1 and 2 lb. cans, 60c per lb.; 4, 5 and 8 lb. cans, 50c per lb. If your dealer will not supply you, send to us. Mail coupon today for book and mitt. Don't delay.

S. C. Johnson & Son, - Racine, Wis.

"The Wood-Finishing Authorities"

Coupon
ACB11

S. C. Johnson & Son
Racine, Wis.
Gentlemen: My
paint dealer's
name is _____

His address is _____

for which please send me free pre-
paid one Johnson Polishing Mitt and
copy of your new book "The Proper
Treatment for Floors, Woodwork and
Furniture," as per your offer.

My name is _____

Address _____

melted, yet the concrete-block building, heated by the fire and with water thrown on it while hot, was uninjured. Inflam-



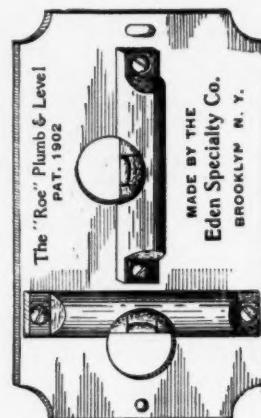
mable material stored against the other side of the concrete wall was not even warm.

The Waterloo machine is manufactured by the Waterloo

Concrete Brick and Block Machine Co., of Waterloo, Iowa, O. H. Sweeney, president and secretary. They have just issued their 1907 catalogue which contains a complete description, with illustrations, and is being circulated to those interested.

The Roe Spirit Level

The accompanying illustration is of the Roe Spirit Level. With the invention of this level has been formulated a device which will lessen the labor of the mechanic as well as make his work more accurate. This level which is called the Roe Level is made both in brass and malleable iron "japanned," is practicable in every sense, can be quickly taken apart and readjusted again in case one of the spirit glasses become broken. This level can be attached to any plumb rule or straight edge at a moment's notice by means of two screws, is very simple to adjust and at the same time is held rigidly in place, it being impossible to be moved in the slightest while in use, and an advantage over most other adjusted levels. This device does away with the awkwardness of holding the ordinary wood level on or against your straight edge when plumbing, and as each spirit glass is thoroughly tested by an expert before set in the level, each level is therefore guaranteed to be just what the concern represent it. This level



A MAN THAT—

can discriminate between good and bad advice needs no advice.

It will work the same way in everything. If you can tell good from bad, no matter what, you are the kind of a man everybody wants; but you are more good to yourself.

There are a number of men who have noticed the difference between good and bad hardware and they know that good stuff costs good money.

Regarding high grade hardware. Did you ever see our Columbian Floor Spring Hinge in action, or simply the sample? Just a word about it for those who have not been fortunate enough to have seen it.

It's practically invisible.

It's Ball-Bearing.

The door can be taken in 10 seconds. It is just the depth of a double floor, 1 1/4 in., therefore it can be placed over a joist or an I beam without cutting into same. It has the hold-back feature at 90 degrees. It has no side plates to disfigure the door.

Would you be interested further in a hinge that has no equal?

Uncle Sam is perfectly willing to carry our catalog to you if you will only say No. 12.

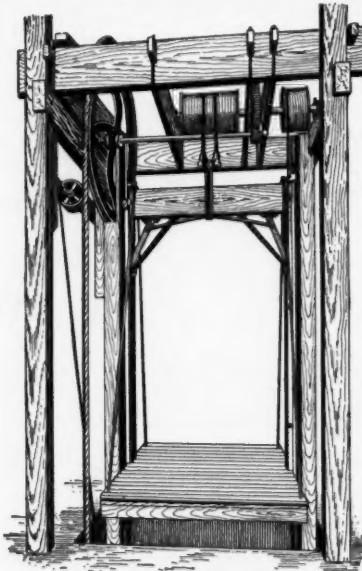
We make twenty-five different kinds of spring hinges, and being in the business forty-seven years means something.

No. 12 is the number.

The Columbian Hardware Co.

CLEVELAND, OHIO.

We Pay the Freight You Install Elevator Yourself



STORE HOIST

We will ship this Elevator direct to you, freight paid and you can install it yourself without expense except the help of the average mechanic. This is an exceptional offer. Everyone knows that EATON & PRINCE means dependable Elevators. No other Elevator is quite as good because none is made with such infinite care. Send for Catalogue No. 99.

EATON & PRINCE COMPANY
70-76 Michigan St., Chicago, Ill.

SEND FOR OUR CATALOG. "HOME HEATING"

HOT-WATER HEATED \$198 by ANDREWS SYSTEM EACH

14 ANDREWS HEATERS IN ONE BLOCK AVERAGE PRICE \$198⁰⁰

IT IS WELL WORTH READING

1906 CATALOG Of Hot Water and Steam Heating

Our new catalog explains fully the principles and advantages of hot water heating, based on 18 years' experience in the cold Northwest, and describes how any carpenter or mechanic can erect the Andrews System in any building from complete plans and directions which we send with each heating plant, saving plumbers' charges.

This book should be in the hands of every contractor and builder. Send your address and names and addresses of two other people who expect to buy heating plants, and we will send our catalog postpaid.

WE DO IT RIGHT IN 44 STATES, CANADA AND ALASKA. Our catalog contains a partial list of our customers from all parts of the country. Look them up and examine the Andrews System in your vicinity.

PRICES. We will sell you the plant with all material complete pipe cut to fit so you can erect it yourself. The cost of each heating plant here shown is based on Minnesota climate and includes an Andrews Steel Boiler, richly ornamented radiators, for every room except the kitchen, pipe cut to fit, fittings, valves, gold bronze, brasses and all other material ready for use, with diagrams and directions so plain and simple that any man handy with tools can erect the plant and save money. You can in this way include the heating plant in your general contract for the building.

FACTORY TO USER. We design, manufacture, guarantee and sell each plant direct from Factory to User, giving you the lowest price for the value. Estimates free. ALL PLANTS GUARANTEED AND SOLD ON 360 DAYS' TRIAL FREE. Freight rates equalized. Old Houses Easily Heated.

ANDREWS HEATING CO. 97 LaSalle Building, Chicago
397 Hennepin Ave., Minneapolis

UNITED STATES NEW FOUNDLAND MANUFACTURERS CONTRACTORS CONSULTING ENGINEERS ALASKA CANADA

FRESH AIR *and* HEAT

INSURED BY THE USE OF THE
HEITLAND RETURN-DRAFT GRATE

It burns wood, coal or gas. In the majority of cases it can be installed without any tearing out of your rooms. It will heat two floors if desired and is a constant and perfect ventilator.

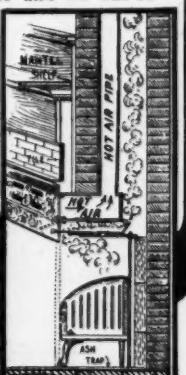
It gives to your rooms all the advantages of the old-fashioned open fireplace with none of its disadvantages. Costs less to maintain and is more satisfactory than any other grate on the market.

Guarantee—If after one winter's use our grates fail to give you satisfaction return same at our expense and we will refund your money.

Send for our special catalogue. It also includes a full line of Wood Mantels, Fireplaces & Furnishings, etc. Free on request.

Heitland Grate & Mantel Co.
827 Maine Street, Quincy, Ill.

Note in the diagram the thorough circulation of heat. Not only throws out into the room its own heat but heats air in chamber directly over bed of fire. Uses smallest amount of fuel, gives off greatest amount of heat.



How Carpenters Can Earn More



For 15 years we have been helping handicapped wage earners to advance themselves and to increase their earnings; and the results we have accomplished in enabling thousands of men to better their positions have proved that today we offer the most practical road to success in existence.

As an example of these results, take the case of Mr. Harvey Brakeman, of New Kensington, Pa. When he became an I. C. S. student, he was a carpenter earning about

\$2 per day. We trained him to be an architect and he is now in business for himself and has an income of nearly \$10,000 per year.

Ambitious building tradesmen who wish to find out the surest, simplest, and quickest way in the world to secure a better position, increased earnings, and a successful future can secure this information by simply clipping, filling out, and sending us the attached coupon. Why don't YOU do this NOW?

International Correspondence Schools
Box 910, Scranton, Pa.
Please explain without further obligation on my part how I can gain a larger salary and advancement to a position as State
Name _____
St. & No. _____
City _____
State _____

is confined not only to the use of carpenters and masons, but is used by all mechanics in the building trades. A catalogue will be sent upon application. The manufacturers are the Eden Specialty Company, 954 Third avenue, Brooklyn, N. Y.

The Tamping Process

It was our pleasure while recently in Bay City, Mich., to visit the home of the Emery & McKerlie Cement Brick Machine Co. They are turning out a very good machine which makes a solid cement brick of the standard size. The manufacture of the brick is all done by tamping, not pressing. By the tamping it is possible to get a more perfect brick and does not require as much hard work or take as much time. The Emery & McKerlie brick machine is simply constructed and weighs about 200 lbs. It stands fifty inches high and is about thirty inches wide, which makes it possible to operate in a small space. For further information in regard to this machine, write to the Emery & McKerlie Brick Machine Co., Bay City, W. S. Mich., mentioning this paper.

A Free Book of Bargains

There is nothing more interesting to ordinary human nature than an illustrated list of household supplies with a description and a low price for each article. That is the reason the new 600-page catalog issued by White, Van Glahn & Co., of Chatham Square, New York, has been so sought by our readers.

This firm is the oldest mail order house in America, having been established in 1816, and their well known policy of refunding full purchase money on any claim of dissatisfaction is the guarantee that goes to every customer for every article bought.

Readers of this paper may secure White, Van Glahn &

Co.'s 600-page catalog with its descriptive, illustrated price list of over 30,000 articles for farm, house or shop, free by writing to Number 3 Chatham Square, New York City.

An Instructive Catalogue

One of the most complete and instructive catalogues that has reached our office is that recently issued by the American Hydraulic Stone Co., of Denver, Colo. It not only points out the qualities of their system, but gives much valuable information to the cement user in general.

Classified Advertisements.

Advertisements under this heading will be inserted at the following rates:	
One month	\$0.45 per line
Three months	1.25 per line
Six months	2.25 per line
One year	4.25 per line

Count 10 words to the line. Situations wanted one-half above rates. Replies may be addressed in our care and will be promptly forwarded.

For Sale.

STEEL SQUARE POCKET FOLDER, with booklet, in leather case. Third edition. Gives roof framing, degrees, polygons, ellipses, etc. 25 cents. Dwight L. Stoddard, 328 West Raymond St., Indianapolis, Ind.

"BAKER'S CEMENT WORKER'S HAND BOOK." A treatise on cement and its use covering over 50 subjects of construction. Complete, Convenient and Practical. Fourth edition revised, cloth bound. 40,000 words. Pocket size the best. Send \$1.00 to W. H. Baker, Wadsworth, O.

Situations Wanted.

SITUATION WANTED—By young man thoroughly familiar with cement block making; would like to take charge of a block plant as foreman or superintendent of construction; carpenter and builder by trade; draw plans, make estimates; capable of doing anything in connection with stone making or building in general. Best of references. Address "Builder," American Carpenter and Builder. N-1.

SITUATION WANTED—As foreman or superintendent for big contracting firm; have contracted for six years; employed eight to ten men; age 34; best of references. Address "D," American Carpenter and Builder. N-1.

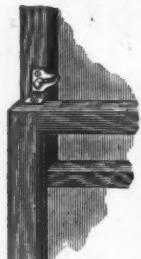
Miscellaneous.

NATURE HAS Supplied living water, 115 degrees F., at Eden Hot Springs, Redlands, Cal., that cures Eczema, Rheumatism and all blood and skin diseases. Rates \$9 to \$12 per week. Stage Wednesdays and Saturdays.

A FEW DOLLARS will start a prosperous mail order business; we furnish catalogues and everything necessary; by our easy method failure impossible. Send for particulars. Milburn-Hicks, 726 Pontiac Bldg Chicago.

SPECIAL OFFER TO CARPENTERS

BUILDERS AND OWNERS OF HOMES

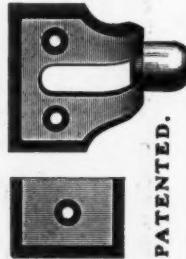


Ives Patent Window Ventilating Lock, a Safe-Guard for Ventilating Rooms, Pure Air, Good Health and Rest Assured.

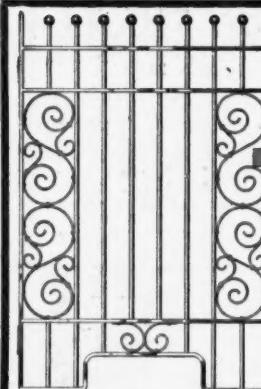
To introduce this article, Four Ventilating Locks in Genuine Bronze, Brass or Antique Copper Finish will be mailed to any address prepaid for One Dollar. Will include a fifty page Hardware Catalogue and Working Model to Carpenters who wish the agency to canvass for its sale. Address,

THE H. B. IVES CO.

NEW HAVEN, CONN., U. S. A.



PATENTED.



No. 5 Wicket. 18x27 inches. Made of Steel, finished Antique Copper.

The Carpenter or Woodworker

who occasionally fits up an office should have one or more of these wickets in stock. The price is low enough to suit you. Also, send for price list of Brass Railings enabling you to estimate cost of same without referring to us for prices.

The Baldwin Brass Works

BRASS, STEEL
AND WIRE WORK
232-234 S. Clinton St., CHICAGO

Complete Catalogue sent upon request

LEARN PLUMBING

A trade that pays well



There was a time when it was only necessary to be a master of any trade and you were sure of pretty steady work, at good wages. But now it is different. There are many trades that do not pay much better wages than those earned by the laboring man.

Today Plumbing is without any question the best paying trade, and the plumber has steady work the year around. On account of the cutting down of the number of apprentices every year and the vast increase in plumbing work, the demand for plumbers in 1907 will be greater than ever.

To the energetic young man who comes to us with the determination to learn, we have something of interest to offer. In this school are only practical plumbers who have spent their lives in the plumbing business and it is these men who teach our students practical work—not theory. We assist our students to secure positions. Right now we have 12 requests for our graduates that we cannot fill.

All we ask is an investigation. Send for illustrated catalogue. It is FREE.

ST. LOUIS TRADE SCHOOL

3988 OLIVE ST.

ST. LOUIS, MO.



When You Get a Sash Bar Like This

You may be sure that it is the **BEST** and **MOST PRACTICAL** device
for holding costly plate glass in the **WORLD**
For Corners, Divisions, Transoms, Circles and ANY and ALL ANGLES

Adjusts itself to settling of Buildings and
Expansion and Contraction of the Glass

Water Proof

Dust Proof

FROST PROOF

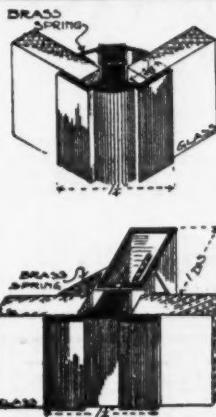
Fire Proof

There is a reason for all these Good Points. Write for Catalogue that tells why

VOLTZ MANUFACTURING COMPANY

815 Francis St.

St. Joseph, Mo.



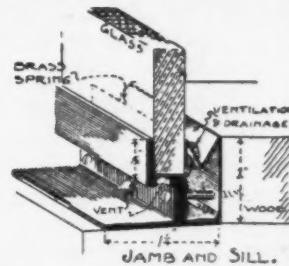
The New "Kawneer" Store Front

IS THE NEWEST AND MOST DURABLE
STORE FRONT CONSTRUCTION KNOWN

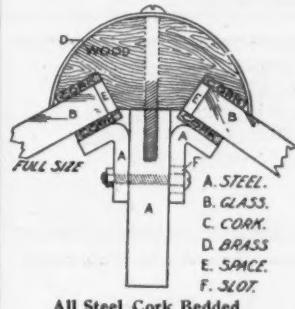
Frostless Glass, because of perfect ventilation.
Fireproof, because made entirely of heavy drawn metal.
Absolutely perfect drainage device.
Insurance 400% less than certain other fronts.
No wood to rot and swell; no painting or repainting.
Electric lights attached to back of bars.
No beveling or boring of the glass.
Allowance for expansion and contraction of glass.
No putty, felt, cork, etc., used.
Gives the greatest glass width.
The glass is set from the outside.
All parts are cut accurately at the factory.
No delay in shipment, orders filled from stock made up.

FOR SALE BY THE TRADE. MANUFACTURED BY

Kawneer Mfg. Co. Office: 505 Kemper Bldg., Kansas City, Mo.
U. S. PATENT MAY 15, 1906. OTHER PATENTS PENDING



(This setting goes all around the glass.)



SHULTZ'S

PATENT

All Steel, Cork Bedded Corner Posts,
Mullions and Transom Bars

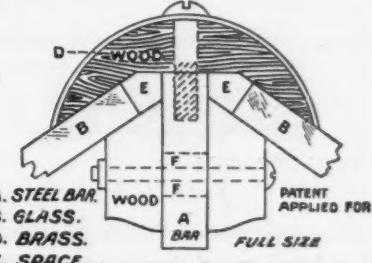
Also my New Steel Post and Bars, in which the Glass
is Bedded between Wood

Reasons why you should use the Shultz Patent Steel
Corner Posts and Bars:

1. Because they are steel and indestructible.
2. Because they are the handsomest and strongest made
3. Because the glass is bedded between Spanish cork
or wood.
4. Because the glass will never crack from settling.
5. Because they are absolutely dust, wind, snow and
water proof.
6. Because expansion, contracting and settling is pro-
vided for.
7. Because they are fitted before shipping and easiest installed.
8. Because they afford more light, take up less space and are put in from outside.

Write for cuts and prices to

C. H. SHULTZ, Patentee and Manufacturer



Acme No. 2 Wood Bedded

St. Joseph, Mo.

ATTRACTIVE STORE FRONTS—MORE LIGHT

THE WAY TO SECURE BOTH IS TO SPECIFY

"PETZ" Corner Post and Transom Bar



CORNER POST

Saves time and money in glazing because glass can be set from outside. It
is the strongest, cheapest and most durable Bar on the market. Will hold the
largest and heaviest light of glass securely, and is impervious to the weather
because metal covered by our patented process. Can be had in any finish.
Prompt delivery.

Get our illustrated booklet "Listen to Petz"—sent free on request. Please
write for it and ask for Circular No. 71, which gives full size illustrations.

Patented Nov. 28, 1905



TRANSOM BAR

DETROIT SHOW CASE CO.

491 West Fort Street,

DETROIT, MICH., U. S. A.

NOTE—Our goods are illustrated in "Sweet's Index," found in the office of
all architects.

It is nicely illustrated, showing practical application of their system in numerous buildings throughout the United States. To those interested in concrete construction, this catalogue will be of great value and it can be had by writing to the American Hydraulic Stone Co., Denver, Colo., and mentioning the AMERICAN CARPENTER AND BUILDER.

Steam Traps

The Joseph Dixon Crucible Co., Jersey City, N. J., publish a very interesting pamphlet on the subject of steam traps. It is an illustrated description of the several varieties, with valuable suggestions of W. H. Wakeman, expert steam engineer and author of well known books on steam engineering.

Some steam users seem to think that a steam trap is only a luxury to be enjoyed by those who have expensive plants in operation and wish to show many extra appliances which might be dispensed with, and not be missed. This is a great mistake, as a trap is valuable according to the cost of fuel that must be burned to make the steam. Certain it is that this pamphlet is well worth most careful reading, for it is instructive as well as interesting.

Swedish Iron Shingle Nails

The following letter of inquiry was recently received by Henry J. Miller & Sons, Bridgewater, Mass.:

GENTLEMEN:

Noticing your advertisement regarding shingle nails will request you to inform me where your Swedish Iron Shingle Nails may be purchased, and if so can they be bought in Boston or Chelsea?

Shingles put on with nails purchased ten years ago and if they were the best quality of shingles all drop off by this time, the nails having rusted off.

Have been using of late the galvanized nails, but have

only a little faith in their standing as do the old Swede iron that I used to use when a young man forty-five years ago. The hardware man a short time ago told me he knew nothing about a Swede's iron shingle nail. Should like to know how to get them, price, etc.

Respectfully,

STOUGHTON, MASS.

GEO. W. PRATT.

It is probable that there may be more of our readers like Mr. Pratt who would prefer to use the genuine Swedish shingle nails, but do not know where to obtain them. As Henry J. Miller & Sons make a specialty of this shingle nail and warrant every keg of their output, it would be well for those who want them or wish to know more about them to write direct to the Miller Co., Bridgewater, Mass., for full information.

SLATE WE HAVE WHAT YOU WANT

In Roofing Slate, Slate Blackboards
Structural and Plumbers' Slate

SATISFACTION GUARANTEED IN QUALITY AND PRICE

ASK FOR DELIVERED PRICES

J. K. HOWER, Station C., Slatington, Pa.

H. J. KICHLIN, Sales Agent.

WHO WANTS SLATE?

Roofing Slate for Houses, Barns, &c. Always clean, beautiful and fireproof. Blackboards for Schools, Colleges, &c. Needs no commendation; universally used all over this and other countries.

Structural Slate. Metal Stock, Sinks, Troughs, Washubs, &c. Superior to all slate for such purposes.

Slate's Supplies. Handmade Slating Tools, Felt, Cement, Nails, Snow-

guards, Painting Machines, &c.

Write for prices and I will tell you all about Slate.

DAVID MCKENNA, Slatington, Pa., U.S.A.

TRADE
SPECIALTIES
FIRE ESCAPES
BUILDING FRONTS!
CORNICES!
MAKERS

"METALSTEEL" PAINT
The Best Protective Coating for
STRUCTURAL STEEL
ST. LOUIS SURFACER & PAINT CO.
13 SO. LEWEE ST., ST. LOUIS, MO.

TRADE
SPECIALTIES
CORRUGATED
ROOFING, PIPING
and GUTTERING

PENNSYLVANIA PAINT & GLASS CO.

Wholesale Dealers in

Paints, Varnishes, Brushes, Colors, Painters' Supplies, Plate, Window and Ornamental Glass, Rough, Ribbed and Wire Glass, Beveled Plates and Mirrors, Art Glass

Exclusive Distributors for
Acme White Lead and Color Works' Products

890-902 SECOND AVENUE, PITTSBURGH, PENNSYLVANIA

The American Combined Level and Grade Finder

SOMETHING ALTOGETHER NEW

All progressive and up-to-date Mechanics, Machinists, Carpenters, Bricklayers, Masons, Plumbers, Millwrights, Road Supervisors, Track Foremen, Surveyors, Architects, Civil Engineers and others will find this an Indispensable Invention.

A Civil Engineer that you may have with you at all times. The most practicable, durable and convenient instrument of the day.

The cost of the instrument is so low that it is within the reach of all. Agents wanted on liberal terms. Apply to

EDWARD HELB, Railroad, Pa., Manufacturer



POINTS THAT INTEREST YOU

**Better
Pay
—
Better
Future**

**Better
Work
—
Better
Hours**

it is said, was due to the work as special counsel for traction matters.

The Mere Money Value of an Education

The average educated man earns \$1,000 per year. He works forty years, making a total of \$40,000 in a lifetime. The average day laborer gets \$1.50 per day, 300 days in the year, or \$450 per year. He earns \$18,000 in a lifetime. The difference between \$40,000 and \$18,000 is \$22,000. This is the minimum value of an education in mere dollars and cents. The increased self respect you gain cannot be measured in money.

¶ No man will purposely choose a poorly-paid, **under** position to one where he can earn a good living salary and command respect and authority. The reason that so many **continue** to toil away day after day at poorly-paid, disagreeable work is because they haven't enough education to do more important work. There was a time when it meant a great sacrifice to secure an education, when the man who had had no chance to get an education in his youth was handicapped for the rest of his life.

¶ The **American School of Correspondence**, Chicago, Ill., has changed all this. Any ambitious man, no matter how little schooling he has had, can start now and fit himself for any position that he is ambitious to fill. Time, cost and location are no barriers. The **American School** allows you to suit your studies to your convenience; and you pay for your instruction according to your circumstances.

POINTS OF SUPERIORITY

1. **Bound Instruction Books** The Books (averaging about 50 in a course) furnished you as you progress, are substantially bound in cloth—not paper pamphlets. In addition, if you enroll now in one of our full courses, you get the "Reference Library of Modern Engineering Practice" in 12 volumes, 6,000 pages, without extra charge.
2. **Personal Instruction** The American School has more teachers for the number of students and a larger proportion of graduates than any other correspondence school. These are the points that determine the real value of the instruction.
3. **No Agents** The money you pay us is not used to maintain an expensive organization of high-priced agents, but is used to give you better instruction at a lower cost.
4. **No Annoyance** You are not annoyed at home or at your place of business by repeated calls from agents.

Check the coupon, send it to us immediately, and receive FREE our 200 page hand-book, giving the names of graduates who have bettered their positions through our instruction.

COUPON (Cut Out)

Please send me 200-page handbook. I am interested in the course marked "X." Am. C. & B., 11-06

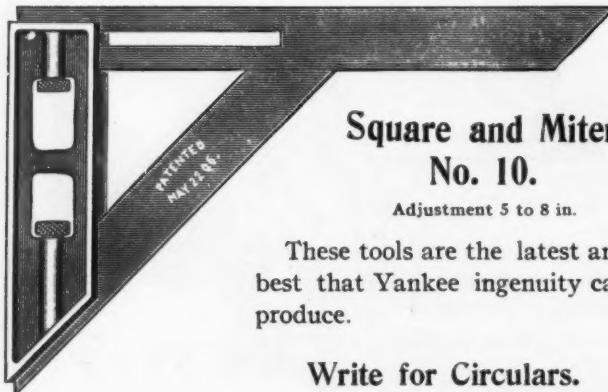
- | | |
|--|--|
| Mechanical Drawing | Structural Drafting |
| Electrical Engineering | Locomotive Engineering |
| Mechanical Engineering | Civil Engineering |
| Telephone Practice | Marine Engineering |
| Telegraphy | Architecture |
| Sheet Mtl. Patt'n Drft'g | Textiles |
| Heating, Ventilation and Plumbing | College Prept'ry Course (fitting for entrance to engineering schools) |
| Stationary Engineering | |

Name _____

Address _____

AMERICAN SCHOOL OF CORRESPONDENCE
3117 Armour Avenue, CHICAGO, ILL.

THE FOX TOOLS



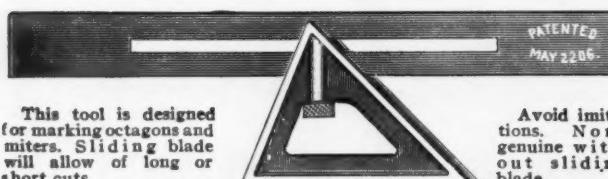
Square and Miter No. 10.

Adjustment 5 to 8 in.

These tools are the latest and best that Yankee ingenuity can produce.

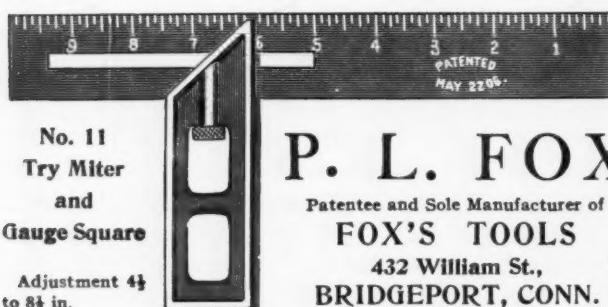
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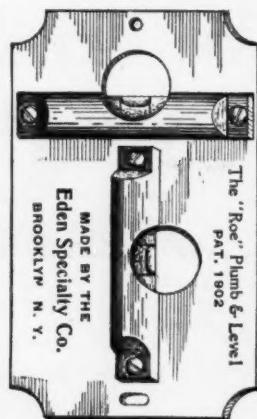
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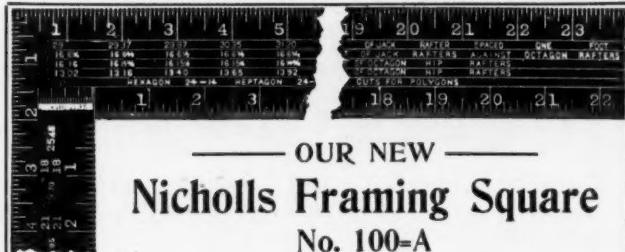
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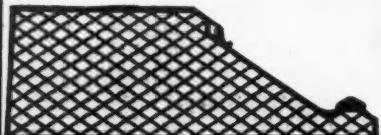
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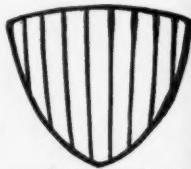


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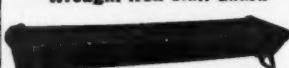
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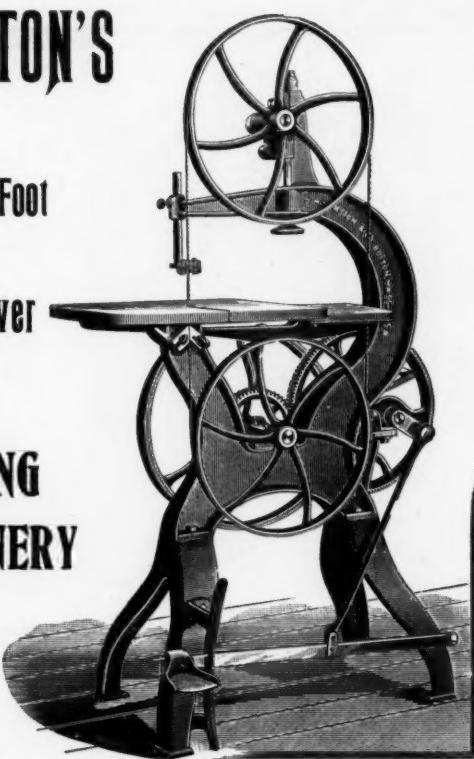
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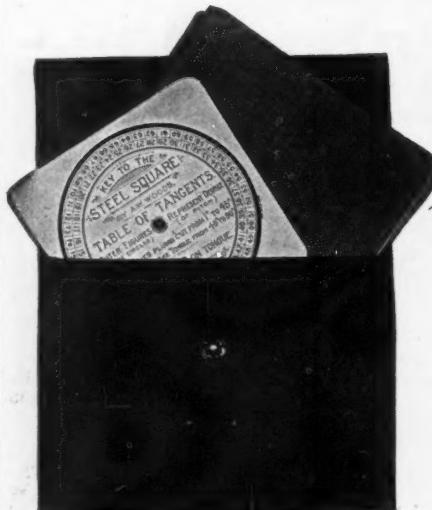
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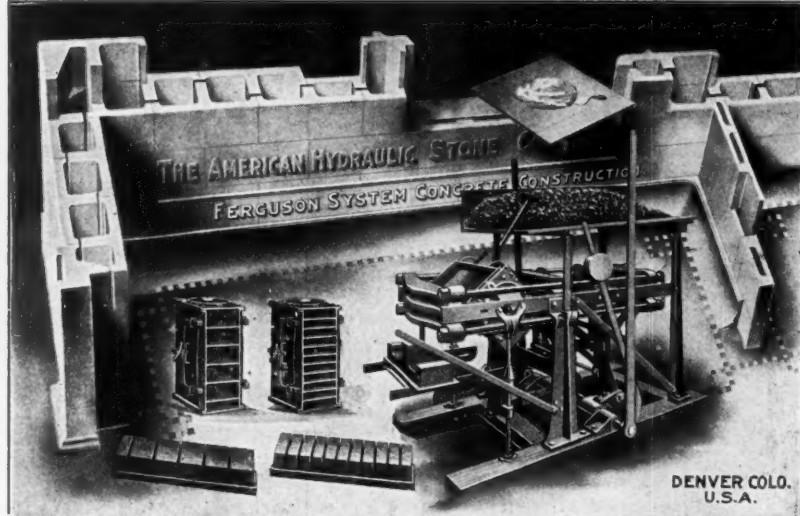
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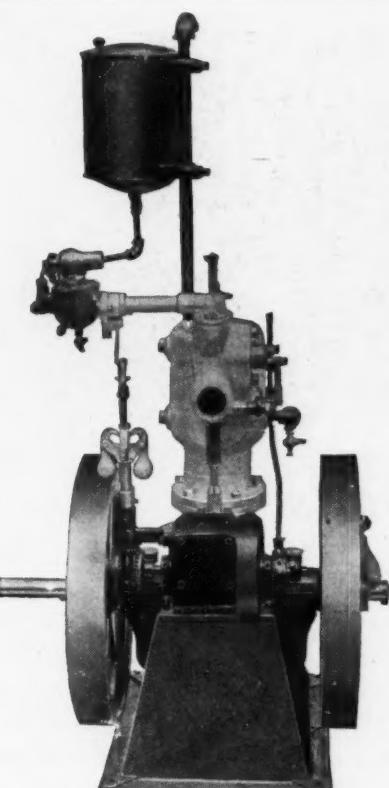


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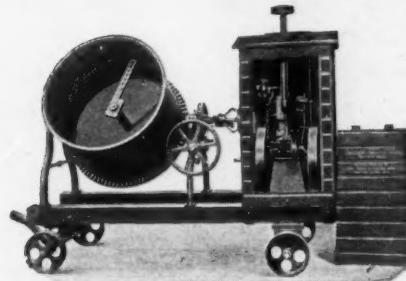
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2 to 50 Horse Power

STANDARD Concrete Machinery

Portable Power Outfits \$270 to \$470,
according to Size and Equipment

THE STANDARD CEMENT BRICK MACHINE is the fastest hand brick machine on the market; will make plain, veneered, and ornamental face and shape; all perfect, smooth brick, true to size and design.

THE STANDARD CONCRETE MIXER handles wet or dry mix; requires little power to operate; mixes batch perfectly in one minute; self-cleaning; easily charged and dumped.

THE STANDARD GAS AND GASOLINE ENGINE is made in all sizes. Especially adapted to running concrete machinery.

THE STANDARD PORTABLE MIXER AND ENGINE are mounted on suitable truck; well designed; convenient to operate.

WRITE FOR CATALOGUE AND PRICES

SOUTH BEND MACHINE MANUFACTURING CO.

1803 South Franklin Street : : : : SOUTH BEND, IND.

Waterloo Concrete Brick & Block Machine Co.

ONE movement of the lever operates the ENTIRE machine, consuming the least time for operation of any machine. Two men will make 250 blocks per day.

Our block is patented. Has double, a vertical and horizontal air space.

The brick attachment makes 18 brick as easily as a block.

No gears or chain to clog or break.

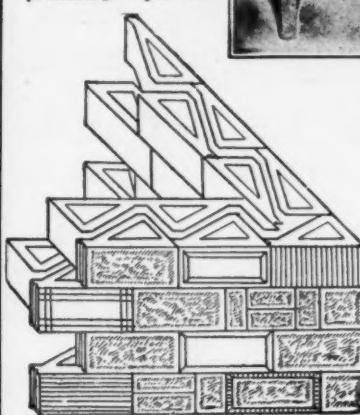
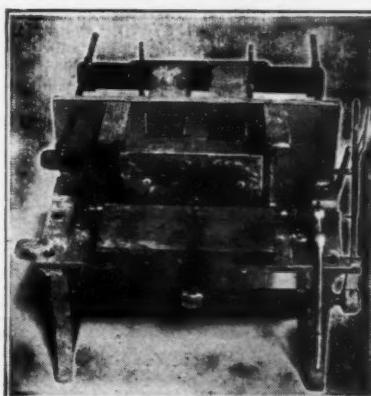
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O. H. SWEENEY, Secretary
101 East 4th Street. Waterloo, Iowa.
Southern Agts., SILVERA & GADSDEN, Savannah, Ga.
Agents for the Pacific Coast, C. J. TALLON & CO.,
618 Bailey Bldg., Seattle, Wash.

The Reed Machines Are in the Lead SPEED! SPEED! SPEED! LOOK AT THIS

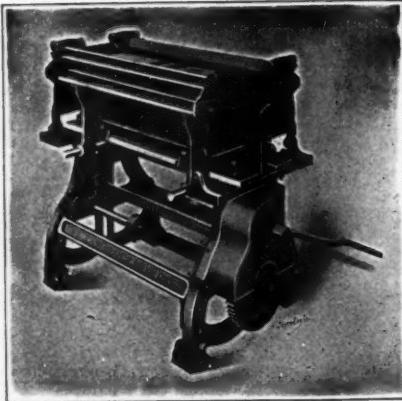
E. W. Ellison, of Peoria, Ill., reports manufacturing, on our Reed Junior Face Down Machine, 210 Concrete Blocks per day, size 8" x 10" x 18" with extra Face, working three men who mixed their own material.

Why not get in the race and use a Machine that lays your competitors in the shade and permits you to secure the business? Perfect Blocks produced. Machines adjustable. Our right angle triangle Block producing triple hole

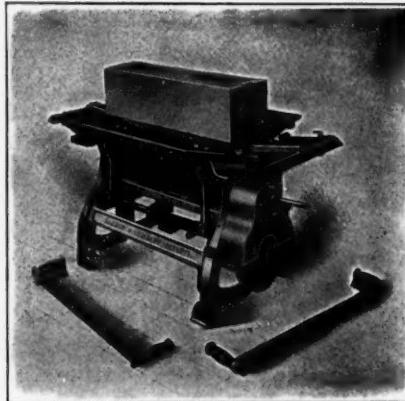


low walls, excels all others and is guaranteed against frost and fire. You want a machine with speed, and the best wall that can be secured.

**Wichita Coal
& Material Co.**
Wichita, Kansas,
U. S. A.



*Only
Machine that
can make
Water-Proof
Work*



The original inventor's latest production in Hollow Concrete Building Block Machines; advancing the industry one hundred per cent

Harmon S. Palmer's Self-Closing-Automatic-Adjustable

The Crystallization of Every Merit in the industry to date. Blocks of every size, length, angle, height and contour produced with astonishing ease and rapidity. Also brick. A marvel of ingenious attachments to the machine which has made more buildings than all infringers and imitators combined. We gave the world the Hollow Concrete Block Industry, the first machine and the first practical block. In the race for advancement and business, we are still in the lead.

Two Highest Awards at St. Louis Exposition. Adopted by the United States Government and Panama Canal Commissioners.

Wanted!—Live Agents, Good Factories and Local Lawyers

We agree to prosecute infringers. Many already enjoined. Many suits pending.

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Washington, D. C.*



Showing Face-Down Position

THE LATEST 4 CONCRETE MACHINES IN 1

1. A Face-Down Machine
None equal it in advantages.
2. An Upright Machine
A marvel of speed, economy and wide range of adjustments.
3. A Two-Piece Block Machine
Exceedingly practical and makes two blocks at once.
4. A Cement Brick Machine
Meets all requirements.

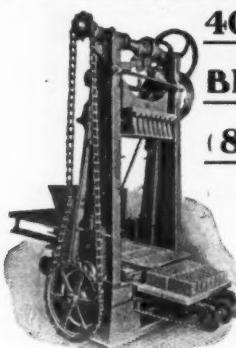
So perfect and convenient is each phase that it operates as though made for each type alone. WONDERFUL in its AUTOMATIC FEATURES—ALL phases operated by ONE SIMPLE LEVER. THIS MACHINE received the GOLD MEDAL at the Portland Exposition over ALL competitors.

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Its product makes the only triple air space wall. The latest and best thing out. Absolutely moisture proof.

The Winget Company furnishes all necessary machinery for a complete up-to-date Concrete Block Plant, including mixers and tampers. For full information address

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**40,000 SAND - CEMENT
BRICK or 5,000 BLOCK
(8 x 24) PER DAY**

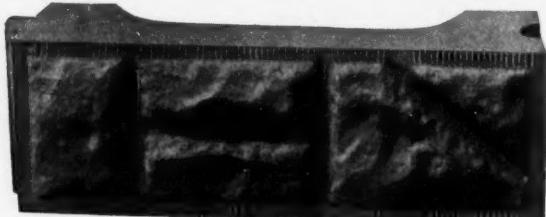
Only TAMPING principle power machine made.

We also make an up-to-date mixer.

Write for our Catalogue of power machines, also of our perfect bond-damp-proof block wall. (Hand moulds).

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THE BEAVERS FAST BUILDING MACHINE

The outfit includes twenty-four different molds, each ranging in length from 10 to 24 inches and 8 inches wide. We have 30 other molds in stock. We have the facilities for casting any design you desire. Write us your wants. We will gladly give you any information about our machine or the concrete business in general. This machine has a capacity of 900 blocks per day

OLSON & RICHARDSON
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Universal Portland Cement Co.,



Successor to

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Manufacturers of

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Daily Output, 6,500 Barrels
Being Increased to 17,000 Barrels
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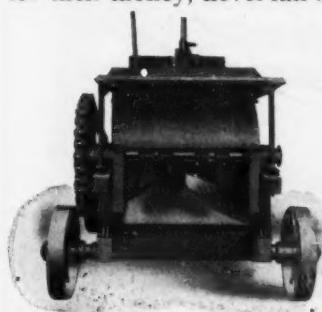
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If either is bad, both are: Concrete must be uniform, for a structure is no stronger than its weakest part. There are no weak parts in the

American's Mix

The mixture is like the mixer—every part true to its purpose. The secret is out. That's the reason for the American's popularity. Discriminating contractors, those who get and give value for their money, never fail to recognize the merits of the American Mixer. Its superiority is too evident. Revolving plows inside the drum do the work.



INVESTIGATE!

Catalogue O.

International F. & Fireproofing Co.,
COLUMBUS, OHIO.

THE HOOSIER



Makes
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Blocks
Face
Down

Adjustable to Different Widths and Lengths

INVESTIGATE

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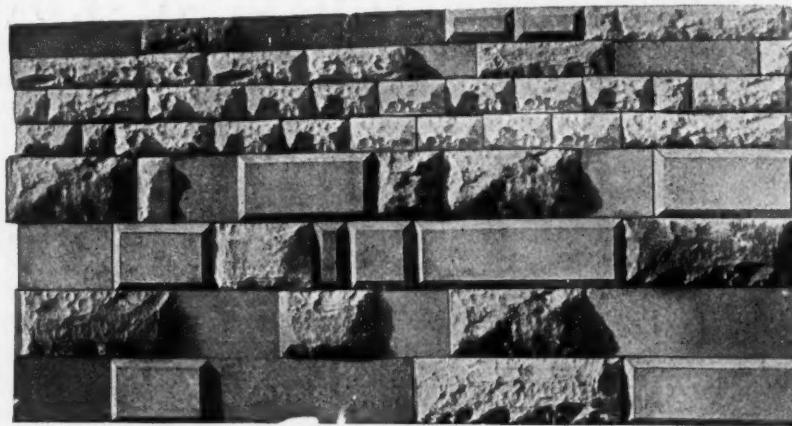
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The five cores give six cross bonds to your block—strength—and allow you to *tamp on the entire face even when the cores are inserted.*

Sound Because Our big illustrated catalog "A" contains a fund of information on the block industry. Send today, it's free

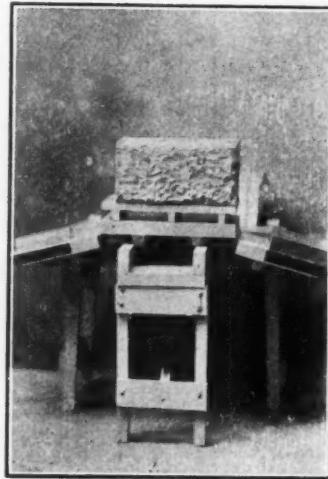
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Ashland Steel Range &
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LOOK! \$35⁰⁰ Complete

Nurock Cement Stone Machine



Guaranteed for
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EQUAL
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MACHINE
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AT
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Everything Furnished With This Machine
Complete for Making Hollow Building Blocks.....

— Makes —
ROCK FACE
PLAIN FACE
CORNER BLOCKS

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Nurock Cement Machine Co.
DELEVAN, N. Y.

SUPERIOR
THE BEST CONCRETE BLOCK MACHINE



The SUPERIOR makes the stone with the face down or in the bottom of the flask, which permits of the use of fine rich material for the face and coarser, cheaper material for the main body of the block.

It is manufactured by
T. O. EICHELBERGER COMPANY
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who will gladly tell you all about it. Write them.
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IT TURNS SAND BANKS INTO BANK ACCOUNTS
Ask for Folder "M"

The Helm Brick Machine

For Cement Brick



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BRICK MACHINE
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THE IMPROVED "MILES"
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MOLDS ALL BLOCKS FACE DOWN

Makes circles, octagons, gables and water table blocks for hollow, solid or veneer walls.

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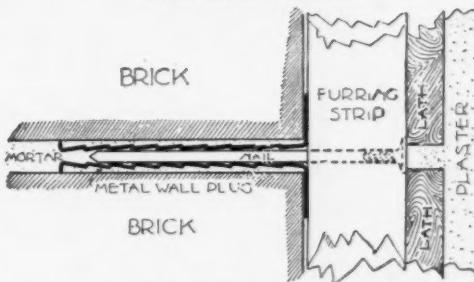
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**RUTTY METAL WALL PLUGS**

They are laid instantly, are indestructible, yet cost less than any other method. Previous difficulties of securing interior finish are entirely overcome by the use of the Rutty Plug.

We make also Morse Steel Wall Ties and Prescott Steel Corner Beads



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Is the only machine that is an absolute success in making blocks face down or vertical—also brick. It can be changed from one form to the other in less than ONE Minute. It can be changed from a block machine into a brick machine in FIVE Minutes. One lever does all the work. THREE machines in one—for one price—Cheapest and best machine on the market.

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So called because it is worked the same as cement or plaster, and will endure heat equal to fire clay products.

For flue linings, chimney blocks and tops, floor and partition blocks, conduits for electric wires, fire proof plaster for wood and metal lath, or as a scratch coat for stucco, this is the ideal material.

A finished product of this composition can always be had in less than twenty-four hours, this permits the formation of the product on the job, and to fit any requirement.

A ventilated flue or chimney from this composition is positively fire proof, and at the same time ventilates all rooms which it enters. Cheap to construct, and will meet the requirement of any size buildings.

Refractory Concrete will prove a profitable proposition for any concrete worker, contractor or builder.

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Write us for full particulars.

The National Hollow Concrete Machine Co.

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Buy A HAYDEN for Results

The Hayden Automatic and Adjustable Block Machine
meets every situation arising in the block business. Its wide range of adjustments, ease of operation and adaptability make it pre-eminent in its field. A plant equipped with a Hayden is thoroughly and properly equipped. The Hayden is the Standard of Excellence.

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Bedford Stone**BUFF AND BLUE****Sawed, Planed, Turned
Cut Ready to Set**

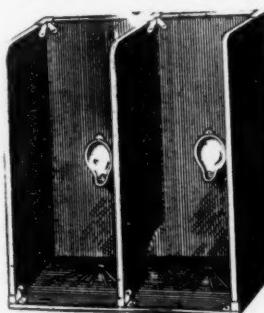
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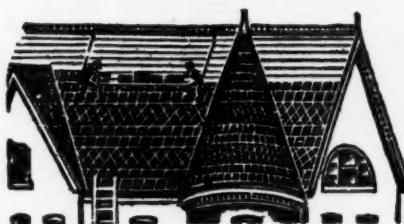
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**BUY A COMPLETE MACHINE
EXTRAS SPLIT THE PROFITS**

**THE NATIONAL CONCRETE
BUILDING-BLOCK MACHINE**

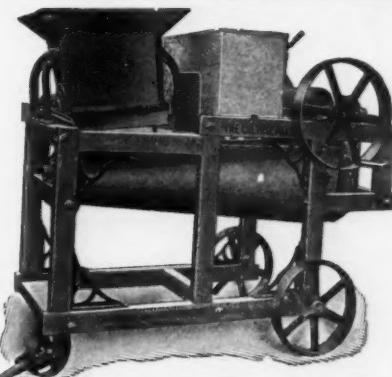
comes to you complete for making all sizes, angles, etc., that are required in building—all made on one pallet and makes them with as little work and time as any machine sold.

OUR CATALOG

gives some good, substantial reasons why you should buy a NATIONAL in preference to other machines and besides contains a fund of information on the business. Send for Catalog "E."

**National Cement Machine Co.
BAY CITY, MICH.**

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UNDER
CRITICAL INSPECTION**



Bluffton, Ind., Sept. 30, 1906.

Gentlemen: Received the Mixer and ran it five days under the inspection of a superintendent who is very exacting and got along all right. I would have remitted last Tuesday, but thought I would wait and try it under the most critical superintendent in Indiana and see what he would do. We worked under him yesterday and he says it is a fine Mix. I have fifteen small jobs of bridge work here and am using crushed stone and sand, the stone is crush or run from stone dust to two-inch cube. The Mixer is all right and I can make money with it. They are just the thime for small jobs out in the country. Enclosed find check in full.

Yours truly,
N. T. MILLER,
Gen. Manager for Michigan Indiana Bridge Co.

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The cut of the church shows what can be done with the Stewart Machine, as this church was erected of blocks made on a Stewart. You can make blocks in any old box, but if you want to make good blocks,

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The OHIO CERAMIC ENGINEERING CO., Cleveland, Ohio
Agents east of Wisconsin, Illinois and the Mississippi River



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Top

Where they are seen and admired by everyone

Made of Cement and in DIFFERENT COLORS

Absolutely Waterproof. Our Roofing Tile Machine will manufacture enough roofing in one day to make it pay you to go into the Cement Tile Roofing Business. Write for our illustrated catalogue and be ready for business.

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When contractors and architects the world over adopt the product of the

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it means that the machines are leaders. Patents protect their efficient methods of tamping, and of raising and lowering the division blades. The bricks are clear cut and flawless.



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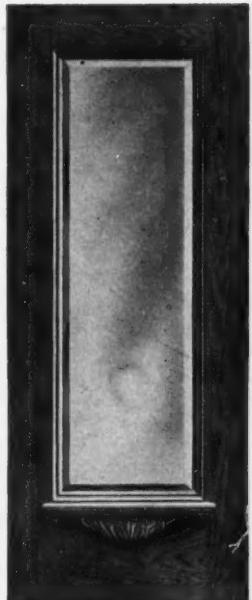
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Price of
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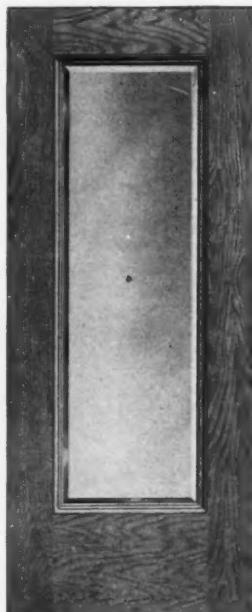


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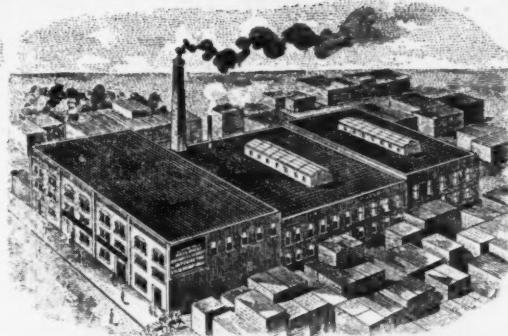
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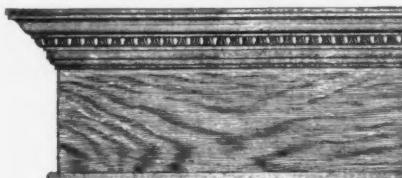
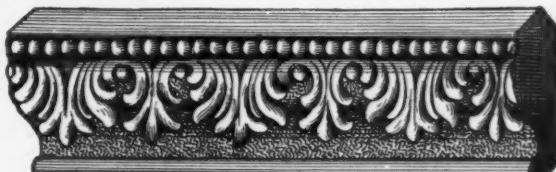
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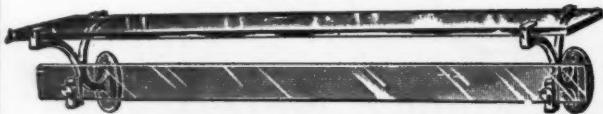
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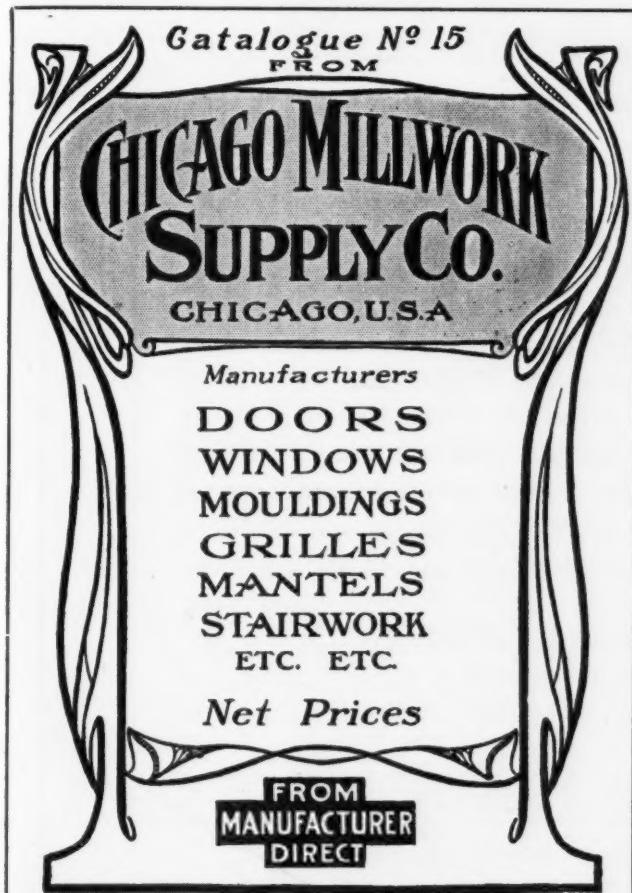
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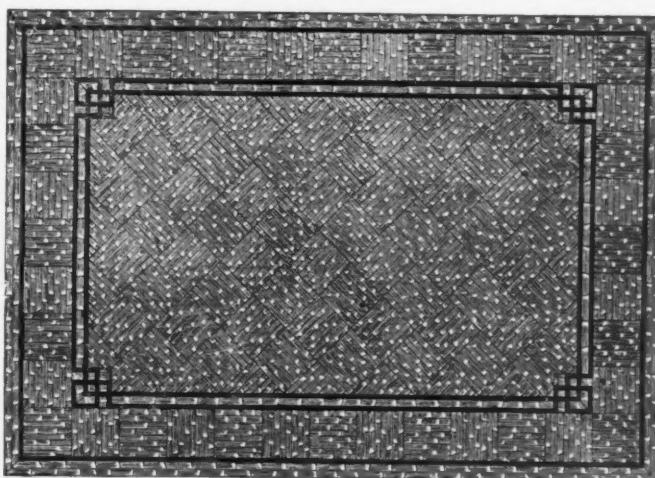
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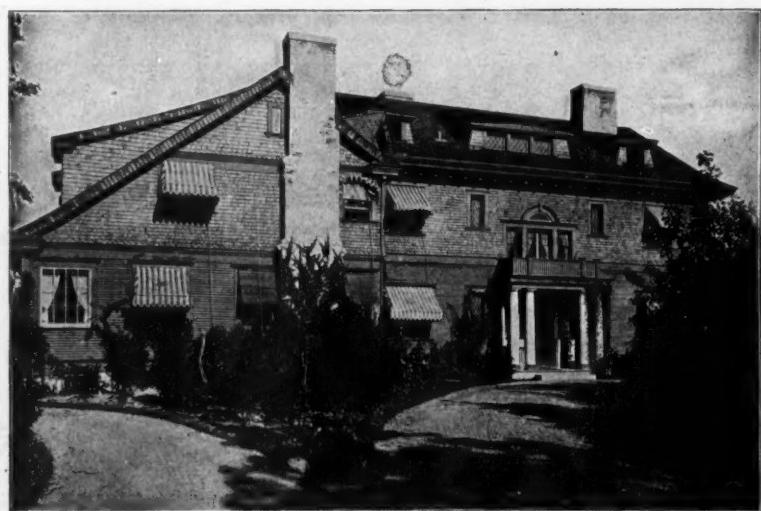


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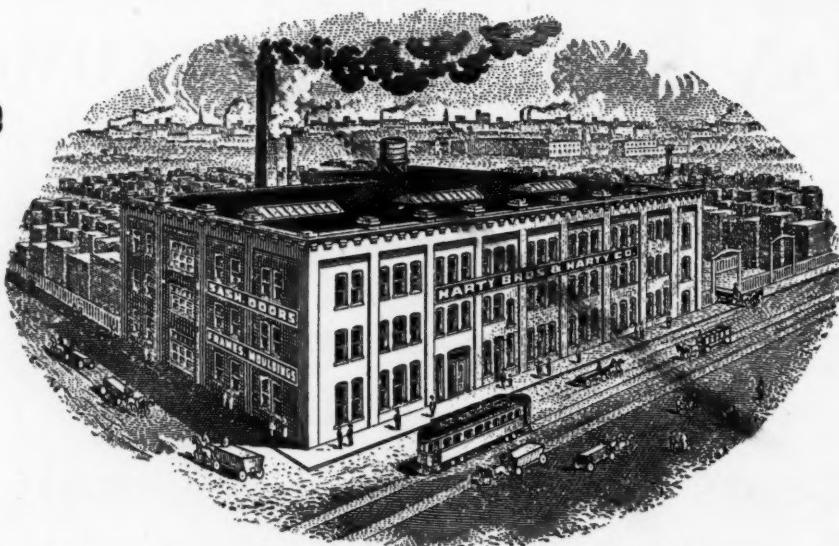
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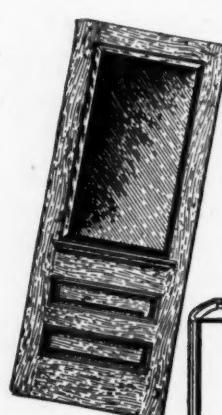
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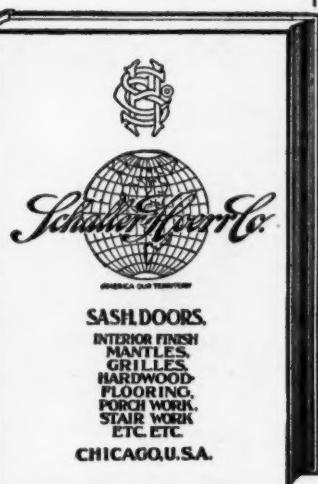
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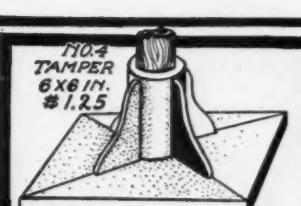
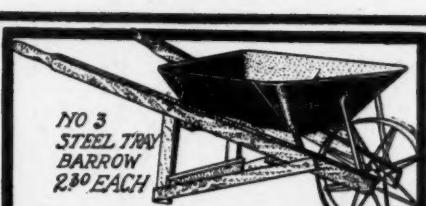
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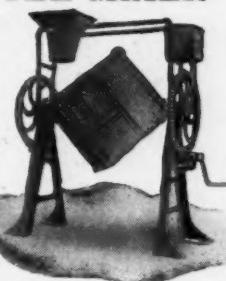


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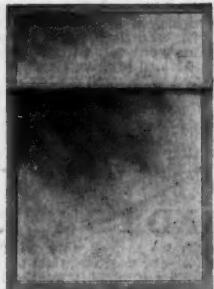
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